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Sexual violence among two populations of men at high risk of HIV infection

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Abstract

This study sought to compare the prevalence of, and relationship between, age at first experience of sexual violence and HIV and other health risk behaviors in two populations of men at high risk of HIV infection. Data were drawn from two cohorts: Vanguard, a prospective study of young men who have sex with men (MSM), and VIDUS, the Vancouver Injection Drug Users Study. Controlling for fixed sociodemographics, multivariate logistic regression was used to assess the relationship between age at first sexual violence (vs. never experiencing it) and several health risk behaviors. There were 140/498 (28%) MSM from Vanguard and 173/932 (19%) injection drug users (IDU) from VIDUS who reported having experienced sexual violence. Among VIDUS men, 130/852 (15%) IDU-only and 43/80 (54%) who were both IDU and MSM reported a history of sexual violence. The prevalence of child sexual abuse was 13% in Vanguard MSM, and 11% among VIDUS IDU-only, but 26% among VIDUS MSM/IDU. The median age of onset was significantly lower among VIDUS IDU-only compared to the two other groups. Experiencing sexual violence first in childhood was strongly related to ever being in the sex trade in both IDU and MSM. MSM in Vanguard who experienced sexual violence in childhood were more likely to have attempted suicide, and have a diagnosed mood disorder. Non-MSM IDU in VIDUS who experienced sexual violence in childhood were more likely to have a diagnosed mental illness, to binge on alcohol, and to have ever accidentally overdosed. In conclusion, men who have ever had sex with men appear to have a higher lifetime prevalence of sexual violence, compared to non-MSM injection drug users. Sexual violence is differentially associated with different health risk behaviors, depending on the age at first occurrence and the primary HIV risk factor (i.e. MSM vs. IDU).

Introduction

We and others have previously shown that a history of sexual violence, particularly in childhood, is strongly associated with engaging in concurrent or future HIV risk behaviors (Bensley, Van Eenwyk, et al., 2000; Braitstein, Li, et al., 2003; Browne & O'Connor, 2000; Champion, Shain, et al., 2001; Djeddah, Facchin, et al., 2000; Garcia-Moreno & Watts, 2000; Gordon & Crehan, 2000; Merrick & Browne, 1999; Miller, 1999; Molnar, Buka, et al., 2001; Parillo, Freeman, et al., 2001). Although there have been descriptive analyses of sexual violence among different sub-populations of at-risk individuals including women (Cohen, Deamant, et al., 2000; Liebschutz, Feinman, et al., 2000), the homeless, and other marginalized populations (Balogh, Bretherton, et al., 2001; Molnar, Shade, et al., 1998; Noell, Rohde, et al., 2001; Wenzel, Koegel, et al., 2000), few studies to date have examined this key issue among men (Paul, Catania, et al., 2001), despite the fact that men, both men who have sex with other men (MSM) and injection drug-using (IDU) men, constitute key HIV risk groups. To our knowledge, there have not yet been any studies that directly compare the prevalence and correlates of sexual violence between at-risk male populations. Such an analysis is crucial for understanding how best to tailor HIV prevention and other health promotion initiatives. It is also important for understanding which sub-populations of men may be at risk for sexual violence at what points in their lives, and for knowing whether experiencing sexual violence is consistently associated with the same outcomes.

Furthermore, there is a paucity of data describing the differential impact of experiences of sexual violence at different ages (Braitstein et al., 2003), and yet these issues are central both to preventing sexual violence and supporting survivors of sexual violence in coming to terms with their experiences.

We have therefore undertaken to compare and contrast the prevalence and correlates of experien-

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cing sexual violence among two different populations of men at high risk for HIV infection: MSM and male IDUs. Our second objective was to describe the differential health risks associated with first experiencing sexual violence at different ages in each population. Our primary hypothesis was that having experienced sexual violence first in childhood would be more strongly associated with health risk behaviors than experiencing sexual violence at other ages, among both MSM and IDU males.

Methods

Data sources

The data for this analysis were drawn from two different cohorts of high HIV risk individuals in British Columbia, Canada. One, the Vanguard Project, is based on men who have sex with men (MSM). The other, the Vancouver Injection Drug Users Study (VIDUS), is a cohort of injection drug users (IDU), both male and female. Details of each of these cohorts are provided below. Data for the Vanguard Project were taken from the 1999/2000 annual self-administered survey, and data for VIDUS participants were obtained from the baseline questionnaire.

The Vanguard Project. The Vanguard Project is a prospective cohort of young gay and bisexual men in the Greater Vancouver area, the methods for which have been described previously (Strathdee, Hogg, et al., 1998). Initiated in May 1995, men who self-identified as gay or bisexual or who had sex with other men were eligible to participate if they were aged 18–30, lived in the Greater Vancouver area, and had not previously tested seropositive for HIV infection. Participants were recruited through community outreach at gay community events, community health clinics, and local physicians, and through gay and mainstream media. Baseline and annual self-administered questionnaires thereafter provide demographic data as well as information regarding sexual behavior and sexual violence. Blood samples are provided at baseline and then annually for HIV testing.

The Vancouver Injection Drug Users Cohort. VIDUS, begun in May 1996, is an ongoing cohort of persons aged 14 and over. Individuals were eligible if they had injected illicit drugs at least once in the previous month, resided in the greater Vancouver region, and provided written informed consent. Study participants were recruited through self-referral and street outreach. At baseline and then semi-annually, participants provide blood samples and complete a questionnaire administered by a trained interviewer. The baseline questionnaire elicited demographic data as well as detailed drug use characteristics, drug use history, detailed sexual behavior with regular and casual partners as well as sex trade clients, and other issues including suicide, mental health, and sexual violence. Self-reported data are also collected for this cohort on sexually transmitted diseases and accidental overdoses. Blood is drawn at each semi-annual interview, and tested for HIV and hepatitis C infection. Men who reported having ever had sex with another man were not included in the multivariate analyses, and were not analyzed separately due to insufficient statistical power.

Outcome measures and variables of interest

Sexual violence data in Vanguard was first collected during the 1999/2000 annual cycle of questionnaires, while VIDUS sexual violence data were collected at baseline (1996 onwards). Sexual violence data were obtained via the same questions for both cohorts. Sexual violence in both cohorts was defined as 'Any type of sexual activity that you were forced or coerced into against your will (including child sexual abuse, molestation, rape, and sexual assault)'. All were asked the age at which sexual violence was first experienced. Based on this question, age at first sexual violence was categorized into child (aged 12 or less), adolescent (aged 13–17), and adult (aged 18 and over), coded as 1, 2, and 3 respectively, with the reference category in both populations coded as 0. These categories were pre-determined based on generally accepted definitions of child, adolescent, and adult.

Baseline sociodemographic characteristics regarding ethnicity (aboriginal vs. other), education (having more than a high school education vs. less), age at baseline (continuous measure), income (less than $10,000 per annum vs. more), and employment (full-time or part-time vs. other) were examined in each of the two cohorts for associations with ever having experienced sexual violence.

Several health risk behaviors were considered as outcomes. They were selected based on their importance as HIV or important health-risk behaviors, and examined in multivariate analyses. Health risk outcomes examined in both cohorts included ever having been in the sex trade (yes vs. no), ever having attempted suicide (yes vs. no), having a diagnosed mental illness or mood disorder (yes vs. no), binge alcohol use (yes vs. no), and number of lifetime sexual partners (greater than 19 vs. less). Outcomes specific to Vanguard participants were having sex with a known HIV-positive person (yes vs. no), and casual unprotected receptive (yes vs. no) and insertive anal sex (yes vs. no). Specific to VIDUS participants were borrowing needles from known HIV-positive individuals (yes vs. no) and ever having accidentally overdosed (yes vs. no).

Statistical analysis

Univariate statistical analyses were conducted using the Chi-Square test for dichotomous variables, Wilcoxon Rank-Sum for non-normal continuous data, and Student's T-Test for normally distributed continuous data. The data were stratified by cohort.

Forward stepwise multivariate logistic regression was used to determine the magnitude of effect of age at first experience of sexual violence on each outcome by entering into each model the categorized age of sexual violence onset variable (with never having experienced sexual violence as the reference category in each case) and all fixed sociodemographics (ethnicity, age, etc).

Variables were considered statistically significant if they were less than .05. All p values are two-sided.

Results

A total of 1430 men were eligible for analysis, including 498 men in Vanguard and 932 men in VIDUS. There were 80 men in VIDUS who reported having had sex with another man, in addition to using injection drugs, and these men were not included in the multivariate analyses. In VIDUS, 135 (14%) of the men were HIV-positive at baseline (Strathdee, Patrick, et al., 1997), and at the time of the 1999/2000 survey, 22 men (4%) were HIV-positive in Vanguard.

As summarized in Table I, the two cohorts are sociodemographically distinct. Vanguard participants are on average eight years younger than VIDUS participants. While over two-thirds (71%) of VIDUS participants are aboriginal, only 8% of Vanguard participants are. The majority (84%) of Vanguard participants completed their high school education, while only 18% of men in VIDUS did.

Table II summarizes the frequency of sexual violence and related issues among both cohorts, and among both IDU-only and MSM/IDU within VIDUS. Among Vanguard participants (MSM), 140/498 (28%) men have experienced sexual violence, compared to 173/932 (19%) in VIDUS ($p < .001$). Among VIDUS participants, 43/80 (54%) men who reported both MSM and IDU behaviors reported a history of sexual violence, compared to only 130/852 (15%) who reported only an IDU history.

Table I. Sociodemographic characteristics of 498 MSM and 932 IDU male participants in the Vanguard Project and the Vancouver Injection Drug Users Study (VIDUS).

	Vanguard $n = 498$	VIDUS $n = 932$
Age (median, IQR)	28 (25 – 32)	36 (28 – 42)
Aboriginal	38 (8%)	659 (71%)
Completed high school	411 (84%)	168 (18%)
Income less than $10,000/year	25 (7%)	68 (7%)
Employed	365 (74%)	581 (62%)
Ever had sex with another man	498 (100%)	80 (0.09%)

The median age of onset of abuse was similar between the MSM/IDU population and the Vanguard MSM group, at 12 years. However, the median age of onset of abuse was significantly lower among the VIDUS IDU-only men (nine years). The prevalence of child sexual abuse (defined as first experience of sexual violence at or below the age of 12 years) was 13% among the MSM in Vanguard, 11% among the IDU-only in VIDUS, and 26% among MSM/IDU men in VIDUS. However, while child sexual abuse represented 46–49% of all sexual violence among both MSM groups, it constituted 71% among the IDU-only group. Thus, although the IDU-only men generally experience much less sexual violence in their lives, the sexual violence they do experience is much more likely to occur at or below the age of 12.

The MSM appear to experience sexual violence first in adulthood more often compared to the IDU-only men: 24% of Vanguard MSM, 23% of VIDUS MSM/IDU, but 8% of IDU-only. While the Vanguard MSM and the VIDUS IDU-only men reported a comparable prevalence of first sexual violence in adolescence (16%), the MSM/IDU men had a prevalence of 26%. Similar proportions among the groups had received counseling (approximately 20–25%).

Table III summarizes sociodemographic characteristics among each cohort associated with having experienced sexual violence. More MSM in Vanguard who had experienced sexual violence were aboriginal (13% vs. 6%, $p = .01$). There were similar proportions of aboriginal people in both groups of VIDUS participants. There were other sociodemographic differences between those who had experienced sexual violence and those who had not: fewer Vanguard MSMs had completed high school (80% vs. 86%, $p = .08$) while more IDU-only had (23% vs. 16%, $p = .03$), and the MSM/IDU who had experienced sexual violence were slightly older than those who did not.

Table IV presents the adjusted logistic regression analyses of the relationship between sexual violence and health risk behaviors among Vanguard MSM and VIDUS IDU-only men (unadjusted analyses are not presented or summarized due to space limitations, and the VIDUS MSM/IDU group was not analyzed due to insufficient statistical power). The data are also summarized below by outcome.

Worked in the sex trade

Both Vanguard MSM (adjusted odds ratio or AOR: 2.6, 95% confidence interval or CI: 1.3–5.0) and the IDU-only men in VIDUS (AOR 4.2, 95% CI: 2.6–

Table II. Prevalence of sexual violence among 498 MSM and 932 IDU male participants in the Vanguard Project and the Vancouver Injection Drug Users Study (VIDUS).

	Vanguard MSM *n* (%)	VIDUS IDU only *n* (%)	VIDUS MSM/IDU *n* (%)
Ever experienced sexual violence	140/498 (28%)	130/852 (15%)	43/80 (54%)
First incident			
12 years and under	65 (46%)	92 (71%)	21 (49%)
13–17 years	23 (16%)	21 (16%)	11 (26%)
18 years and over	34 (24%)	11 (8%)	10 (23%)
Age not stated	18 (13%)	6 (5%)	1 (2%)
Median age at onset (IQR)	12 (8–18)	9 (6–13)	12.5 (6–17)
Ever disclosed prior to interview	n/a	90 (69%)	31 (72%)
Ever received counseling	35 (25%)	29 (22%)	10 (23%)

6.9) were more likely to have been in the sex trade if they first experienced sexual violence in childhood. However, while first sexual violence in childhood is the only factor associated with sex trade involvement in the MSM group, first sexual violence in the IDU group in both adolescence (AOR 3.5, 95% CI: 1.3–9.1) and adulthood (AOR 15.3, 95% CI: 2.0–117.0) was also significantly associated with having been in the sex trade.

Attempted suicide

Quite different patterns exist between the MSM and IDU groups in terms of having ever attempted suicide. Among the MSM, first sexual violence in childhood (AOR 3.8, 95% CI: 2.0–7.0) and adulthood (AOR 3.1, 95% CI: 1.4–7.3), but not adolescence, were strongly associated with having attempted suicide. In contrast, among the IDU men, only first sexual violence in adolescence (AOR 4.3, 95% CI: 1.7–11.1) was associated with a suicide attempt.

Diagnosed mood disorder or mental illness

Interestingly, both MSM and IDU who first experienced sexual violence in either childhood (MSM AOR 2.7, 95% CI: 1.5–4.8; IDU AOR 1.9, 95% CI: 1.2–3.0) or adulthood (MSM AOR 2.6, 95% CI: 1.2–5.4; IDU AOR 3.7, 95% CI: 1.1–12) were more likely to have been diagnosed with either a mood disorder or mental illness. However, first sexual violence in adolescence was not associated with mental health diagnosis in either group.

Alcohol use

IDU-only men who had first experienced sexual violence in childhood were those more likely to binge on alcohol (AOR 1.9, 95% CI: 1.2–3.0).

Table III. Sociodemographic characteristics associated with ever experiencing any sexual violence among 498 MSM in Vanguard, 852 IDU-only VIDUS participants, and 80 MSM/IDU in VIDUS.

	History of sexual violence		
	Yes *n* (%)*	No *n* (%)	*p*
Aboriginal			
MSM	17 (13%)	21 (6%)	.01
IDU only	91 (70%)	514 (71%)	.42
MSM/IDU	27 (63%)	26 (70%)	.32
More than high school education			
MSM	109 (80%)	302 (86%)	.08
IDU only	30 (23%)	115 (16%)	.03
MSM/IDU	13 (30%)	10 (27%)	.47
Income less than $10K/year			
Vanguard	7 (7%)	18 (7%)	.85
IDU Only	9 (7%)	59 (8%)	.39
MSM/IDU	43 (100%)	37 (100%)	n/a
Age at baseline (median, IQR)			
MSM	29 (25–32)	28 (24–31)	.17
IDU Only	36 (31–41)	36 (29–42)	.53
MSM/IDU	31 (25–35)	29 (23.5–35)	.04

*Percentages reflect proportion of those who have experienced sexual violence or not who are (e.g.) aboriginal.

Sex with or borrowing needles from an HIV-positive person

Sexual violence was not associated with knowingly having sex with or borrowing needles from an HIV-positive person, regardless of the age at which sexual violence first occurred.

Lifetime number of sexual partners

Similarly, sexual violence at any age was not significantly associated with the lifetime number of sexual partners in either cohort.

Having accidentally overdosed

Among IDU-only, having first experienced sexual violence in childhood was associated with an increased probability of having ever accidentally overdosed (AOR 1.8, 95% CI: 1.2–2.8).

Casual unprotected anal intercourse

Among MSM, only those whose first experience of sexual violence was in adulthood reported an increased probability of engaging in casual unprotected receptive (but not insertive) anal intercourse.

Discussion

Our data suggest that men who have sex with men may have an overall higher prevalence of sexual violence in their lifetimes (28% among Vanguard men), compared to men who only use injection drugs (15%). However, the prevalence of sexual violence among VIDUS men who reported both injection drug use and having had sex with another man was the highest, at 54%.

While the prevalence of child sexual abuse is similar between the MSM (13%) and the IDU-only (11%) groups, it is considerably higher in MSM/IDU (26%). However, the IDU-only males report a much lower age of onset of sexual violence, and a lower prevalence of first experiencing sexual violence in adulthood. While IDU-only men report less sexual violence overall, what sexual violence they do experience is much more likely to have occurred at or below the age of 12.

Our data further suggest that both men who have sex with other men, and injection drug using men who have experienced sexual violence, experience a number of known HIV and other health risks. Data from the two cohorts indicate that experiencing any sexual violence in childhood is strongly associated, after controlling for fixed sociodemographics, with ever being in the sex trade. Among the MSM the probability of ever being in the sex trade is not associated with sexual violence in adolescence or adulthood, while among the IDU there is a significant association between ever being in the sex trade and experiencing sexual violence later in life. These results may a have a number of explanations. It may be that men who experience child sexual abuse are more likely to enter the sex trade, which would be consistent with other studies (Petrak, Byrne, et al., 2000; Seng, 1989; Sheldrick, 1991). Men who experience sexual violence at other times in their lives may participate in the sex trade as a result of the sexual violence, related to the psychological impact of sexual violence, or they may be experiencing sexual violence as a consequence of being in the sex trade. Unfortunately this analysis could not establish the temporality of issues other than the onset of sexual violence.

Men who have sex with other men were significantly more likely to report attempted suicide if they had experienced sexual violence in either childhood or as an adult. The association between attempted suicide and first sexual violence in adolescence was not statistically significant: this result may be due to small numbers and therefore limited power. Although temporality and the causal link between these experiences is impossible to establish firmly, a considerable body of literature suggests that there is an important relationship between sexual violence and attempting suicide, which our data supports (Beckinsale, Martin, et al., 1999; Hendricks-Matthews, 1993; McCauley, Kern, et al., 1997; Molnar, Shade, et al., 1998; Roy, 2001; Thakkar, Gutierrez, et al., 2000; Vajda & Steinbeck, 2000).

The patterns among both MSM and IDU in terms of the relationship between sexual violence and a diagnosed mood disorder or mental illness are similar. Both groups of men were more likely to have a mental health diagnosis if they had first experienced sexual violence either in childhood or adulthood. Again, there may be varying explanations for the results. For example, it may be that experiencing child sexual abuse leads to later mental health complications (Fleming, Mullen, et al., 1999; Golding, Stein, et al., 1988; Hanson, Saunders, et al., 2001; Heffernan & Cloitre, 2000; King, Mandansky, et al., 2001; Lipman, MacMillan, et al., 2001; Zanarini, 2000), or it may be that sexual predators target people with mental illness because they are more vulnerable.

The findings that IDU men who have experienced child sexual abuse are more likely to binge on alcohol and to have accidentally overdosed suggest that these men use drugs and alcohol less than moderately, perhaps indicating that the abuse of drugs and alcohol is a coping or 'numbing' mechanism (Bonin, Norton, et al., 2000; Gentilello, Rivara, et al., 2000;

Table IV. Adjusted* analyses of relationship between age at first sexual violence and health risk behaviors among 498 MSM and 852 IDU male participants in the Vanguard Project and the Vancouver Injection Drug Users Study (VIDUS).

	Vanguard (MSM)		VIDUS (IDU only)	
	AOR (95% CI)	*p*	AOR (95% CI)	*p*
Sex trade ever				
Never	1.0	–	1.0	–
<12 years	2.6 (1.3–5.0)	0.005	4.2 (2.6–6.9)	<0.001
13–17 yrs	2.0 (0.65–6.3)	0.217	3.5 (1.3–9.1)	0.010
>18 yrs	1.6 (0.64–4.2)	0.306	15.3 (2.0–117.0)	0.009
Ever attempted suicide				
Never	1.0	–	1.0	–
<12 years	3.8 (2.0–7.0)	<0.001	1.5 (0.90–2.6)	0.119
13–17 yrs	2.6 (0.94–7.2)	0.067	4.3 (1.7–11.1)	0.002
>18 yrs	3.1 (1.4–7.3)	0.008	1.5 (0.39–5.6)	0.573
Diagnosed mood disorder (Vanguard) or mental illness (VIDUS)				
Never	1.0	–	1.0	–
<12 years	2.7 (1.5–4.8)	<0.001	1.9 (1.2–3.0)	0.004
13–17 yrs	2.3 (0.88–6.0)	0.090	1.3 (0.53–3.3)	0.543
>18 yrs	2.6 (1.21–5.4)	0.013	3.7 (1.1–12.5)	0.032
Alcohol use: >10 drinks per week (Vanguard) or bingeing (VIDUS)				
Never	1.0	–	1.0	–
<12 years	1.1 (0.50–2.5)	0.803	1.9 (1.2–3.0)	0.004
13–17 yrs	1.2 (0.33–4.4)	0.772	1.8 (0.75–4.5)	0.187
>18 yrs	0.99 (0.33–3.0)	0.999	0.96 (0.32–2.9)	0.949
Sex with (Vanguard) or borrow needles from (VIDUS) HIV-positive person				
Never	1.0		1.0	–
<12 years	1.2 (0.59–2.5)	0.610	1.8 (0.97–3.3)	0.061
13–17 yrs	1.4 (0.43–4.4)	0.596	0.43 (0.06–3.2)	0.411
>18 yrs	1.2 (0.49–2.9)	0.706	2.6 (0.69–9.6)	0.162
Lifetime number of sexual partners (>19)				
Never	1.0	–	1.0	–
<12 years	0.94 (0.53–1.7)	0.838	1.0 (0.63–1.7)	0.929
13–17 yrs	0.63 (0.23–1.8)	0.384	1.6 (0.67–4.1)	0.280
>18 yrs	0.98 (0.47–2.1)	0.966	1.2 (0.36–3.9)	0.794
Ever accidentally overdosed				
Never	–	–	1.0	–
<12 years	–	–	1.8 (1.2–2.8)	0.010
13–17 yrs	–	–	1.1 (0.46–2.6)	0.831
>18 yrs	–	–	2.4 (0.74–7.9)	0.146
Casual unprotected receptive anal intercourse				
Never	1.0	–	–	–
<12 years	1.7 (0.85–3.5)	0.134	–	–
13–17 yrs	1.6 (0.49–5.1)	0.437	–	–
>18 yrs	2.5 (1.1–5.8)	0.032	–	–
Casual unprotected insertive anal intercourse				
Never	1.0	–	–	–
<12 years	1.5 (0.77–2.8)	0.244	–	–
13–17 yrs	1.8 (0.64–5.0)	0.263	–	–
>18 yrs	2.0 (0.91–4.3)	0.086	–	–

*Adjusted analyses control for ethnicity, age, and education level at time of enrolment.

Heffernan, Cloitre, et al., 2000; Jasinski, Williams, et al., 2000; Kendler, Bulik, et al., 2000; McCauley et al., 1997; Parillo et al., 2001).

Among the MSM, there was a strong association between first experiencing sexual violence in adulthood and casual unprotected receptive anal intercourse. Although impossible to prove, we hypothesize that this finding may be because men who participate in casual sex may be at higher risk of experiencing sexual violence.

Our data strengthen the literature on the topic of sexual violence and adverse consequences, particularly regarding child sexual abuse and HIV risk behavior. Jay Paul's data shown that 20% of MSM in their sample experienced child sexual abuse, and that this experience is associated in a dose response

fashion (number of coercive experiences) with serodiscordant sexual risk, frequent anal sex under the influence of alcohol and/or drugs, casual sex, and being depressed (Paul et al., 2001). Browne and O'Connor (2000) found that the prevalence of child sexual abuse among a sample of injection drug users in Dublin was 21%, and that this was significantly associated with substance misuse. There are many other studies of populations infected with or at risk for HIV showing prevalence estimates comparable to ours, although the majority of these are among women and girls (Cohen et al., 2000; Gielen, McDonnell, et al., 2001; Liebschutz et al., 2000; Pao, Lyon, et al., 2000; Parillo et al., 2001; Petrak et al., 2000; Young & Katz, 1998; Zierler, Witbeck, et al., 1996). There are also numerous publications showing associations between a history of sexual violence and HIV risk (Cohen et al., 2000; Johnsen & Harlow, 1996; Lodico & DiClemente, 1994; Paul et al., 2001; Wingood & DiClemente, 1997; Young & Katz, 1998) and other major health concerns such as suicidality (Beckinsale et al., 1999; Kaslow, Thompson, et al., 2000; Kisiel & Lyons 2001; Thakkar et al., 2000), heavy drinking (Gentilello et al., 2000; Jasinski et al, 2000), and mental illness and mood disorders (Hyun, Friedman, et al., 2000; Stewart & Ross, 1999; Zanarini, 2000).

Our data contribute to the growing body of literature on the topic of sexual violence in three distinct ways. One, our analysis specifically addresses sexual violence among males, which, with the exception of Paul et al.(2001), is a population that has been relatively neglected in the literature despite being an important HIV-affected population. Two, we have compared two very different populations of men at high risk for HIV, with a smaller analysis of men with both risk factors, enabling a much deeper understanding of the ways in which sexual violence may be related to health risk behaviors. A third strength to our analysis is that we have examined the association between sexual violence at different ages of onset and various health risk behaviors.

As with any study, there are also limitations to our analysis. One is that while the questionnaire is interviewer-administered among VIDUS participants, it is self-administered in Vanguard. This may mean that prevalence and correlates of sexual violence may be either under- or over-estimated in either group. Two, all prevalence estimates may be under-estimates, possibly related to an unwillingness to report sexual activity of any nature with another man, or because the psychological effects of sexual violence could cause participants to not acknowledge their own experiences. Three, it is impossible to determine the temporal relationship between the outcomes and much of the sexual violence, notably that which occurred in adulthood. Four, the potential differences in follow-up time of VIDUS vs. Vanguard participants may have increased the likelihood of sexual violence occurring in adulthood, as well as increased the likelihood of the outcomes occurring among Vanguard participants, in spite of their younger age.

Conclusion

In conclusion, our data suggest that sexual violence is very common among men considered at high risk of HIV infection. Men who have or have had sex with other men (MSM) in our analysis have the highest reported prevalence, with the men who are both injection drug users (IDUs) and MSM having the highest prevalence at 54%. While the IDU-only men have the lowest prevalence (15%), they are more likely to experience sexual violence at or below the age of 12.

Our primary hypothesis was that experiencing sexual violence first in childhood would be more strongly associated with health risk behaviors than experiencing sexual violence at other ages, among both MSM and IDU. While we found a general trend suggesting that this is the case, in fact the data suggest the issue of age-at-onset is more complicated. Further, while we found many strong associations between sexual violence and health risk behaviors, there were several specific HIV risk behaviors which were not found to be associated with sexual violence in multivariate analysis.

Our data indicate a compelling need for HIV prevention and health promotion campaigns that target sexual violence and child sexual abuse in men as important related factors, including programs that address the physical and psychological aftermath of sexual violence. Our data also suggest that sexual violence in the MSM community is a frequent occurrence even among adults, and that these experiences are strongly associated with attempted suicide, mental illness, and unprotected anal intercourse. Therefore, HIV prevention and health promotion campaigns among MSM need to incorporate techniques aimed at preventing and/or coping with the effects of adult sexual violence, in addition to more general programs aimed at the prevention and treatment of child sexual abuse.

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References

Balogh, R., Bretherton, K., et al. (2001). Sexual abuse in children and adolescents with intellectual disability. *Journal of Intellectual Disability Research*, *45*, 194–201.

Beckinsale, P., Martin, G., et al. (1999). Sexual abuse and suicidal issues in Australian young people. An interim report. *Australian Family Physician*, *28*, 1298–1303.

Bensley, L.S., Van Eenwyk, J., et al. (2000). Self-reported childhood sexual and physical abuse and adult HIV-risk behaviors and heavy drinking. *American Journal of Preventive Medicine*, *18*, 151–158.

Bonin, M.F., Norton, G.R., et al. (2000). Drinking away the hurt: The nature and prevalence of PTSD in substance abuse patients attending a community-based treatment program. *Journal of Behavior Ther Exp Psychiatry*, *31*, 55–66.

Braitstein, P., Li, K., et al. (2003). Sexual violence among a cohort of injection drug users. *Social Science and Medicine*, *57*, 561–569.

Browne, R., & O'Connor, J. (2000). Child abuse and the clinical course of drug misuse. *British Journal of Psychiatry*, *177*, 469.

Champion, J.D., Shain, R.N., et al. (2001). Sexual abuse and sexual risk behaviors of minority women with sexually transmitted diseases. *Western Journal of Nursing Research*, *23*, 241–254.

Cohen, M., Deamant, C., et al. (2000). Domestic violence and childhood sexual abuse in HIV-infected women and women at risk for HIV. *American Journal of Public Health*, *90*, 560–565.

Djeddah, C., Facchin, P., et al. (2000). Child abuse: Current problems and key public health challenges. *Social Science and Medicine*, *51*, 905–915.

Fleming, J., Mullen, P.E., et al. (1999). The long-term impact of childhood sexual abuse in Australian women. *Child Abuse and Neglect*, *23*, 145–159.

Garcia-Moreno, C., & Watts, C. (2000). Violence against women: Its importance for HIV/AIDS. *AIDS*, *14*(Suppl. 3), S253–S265.

Gentilello, L.M., Rivara, F.P., et al. (2000). Alcohol problems in women admitted to a level I trauma center: A gender-based comparison. *Journal of Trauma-Injury Infection and Critical Care*, *48*, 108–114.

Gielen, A.C., McDonnell, K.A., et al. (2001). Quality of life among women living with HIV: The importance of violence, social support, and self care behaviors. *Social Science and Medicine*, *52*, 315–322.

Golding, J.M., Stein, J.A., et al. (1988). Sexual assault history and use of health and mental health. *American Journal of Community Psychology*, *16*, 625–644.

Gordon, P., & Crehan, K. (2000). *Dying of sadness: Gender, sexual violence and the HIV epidemic*. United Nations Development Program.

Hanson, R.F., Saunders, B., et al. (2001). Impact of childhood rape and aggravated assault on adult mental health. *American Journal of Orthopsychiatry*, *71*, 108–119.

Heffernan, K., & Cloitre, M. (2000). A comparison of posttraumatic stress disorder with and without borderline personality disorder among women with a history of childhood sexual abuse: Etiological and clinical characteristics. *Journal of Nervous and Mental Disease*, *188*, 589–595.

Heffernan, K., Cloitre, M., et al. (2000). Childhood trauma as a correlate of lifetime opiate use in psychiatric patients. *Addictive Behaviors*, *25*, 797–803.

Hendricks-Matthews, M.K. (1993). Survivors of abuse: Health care issues. *Primary Care: Clinics in Office Practice*, *20*, 391–406.

Hyun, M., Friedman, S.D., et al. (2000). Relationship of childhood physical and sexual abuse to adult bipolar disorder. *Bipolar Disorder*, *2*, 131–135.

Jasinski, J.L., Williams, L.M., et al. (2000). Childhood physical and sexual abuse as risk factors for heavy drinking among African-American women: A prospective study. *Child Abuse and Neglect*, *24*, 1061–1071.

Johnsen, L.W., & Harlow, L.L. (1996). Childhood sexual abuse linked with adult substance use, victimization, and AIDS risk. *AIDS Education and Prevention*, *8*, 44–57.

Kaslow, N.J., Thompson, M.P., et al. (2000). Ratings of family functioning of suicidal and nonsuicidal African American women. *Journal of Family Psychology*, *14*, 585–599.

Kendler, K.S., Bulik, C.M., et al. (2000). Childhood sexual abuse and adult psychiatric and substance use disorders in women: An epidemiological and cotwin control analysis. *Archives of General Psychiatry*, *57*, 953–959.

King, J.A., Mandansky, D., et al. (2001). Early sexual abuse and low cortisol. *Psychiatry and Clinical Neurosciences*, *55*, 71–74.

Kisiel, C.L., & Lyons, J.S. (2001). Dissociation as a mediator of psychopathology among sexually abused children and adolescents. *American Journal of Psychiatry*, *158*, 1034–1039.

Liebschutz, J.M., Feinman, G., et al. (2000). Physical and sexual abuse in women infected with the human immunodeficiency virus: Increased illness and health care utilization. *Archives of Internal Medicine*, *160*, 1659–1664.

Lipman, E.L., MacMillan, H.L., et al. (2001). Childhood abuse and psychiatric disorders among single and married mothers. *American Journal of Psychiatry*, *158*, 73–77.

Lodico, M. A., & DiClemente, R. J. (1994). The association between childhood sexual abuse and prevalence of HIV-related risk behaviors. *Clinical Pediatrics*, (August), 498–502.

McCauley, J., Kern, D.E., et al. (1997). Clinical characteristics of women with a history of childhood abuse: Unhealed wounds. *Journal of the American Medical Association*, *277*, 1362–1368.

Merrick, J., & Browne, K.D. (1999). Child abuse and neglect—a public health concern. *Public Health Review*, *27*, 279–293.

Miller, M. (1999). A model to explain the relationship between sexual abuse and HIV risk among women. *AIDS Care*, *11*, 3–20.

Molnar, B.E., Buka, S.L., et al. (2001). Child sexual abuse and subsequent psychopathology: Results from the National Comorbidity Survey. *American Journal of Public Health*, *91*, 753–760.

Molnar, B.E., Shade, S.B., et al. (1998). Suicidal behavior and sexual/physical abuse among street youth. *Child Abuse and Neglect*, *22*, 213–222.

Noell, J., Rohde, P., et al. (2001). Childhood sexual abuse, adolescent sexual coercion and sexually transmitted infection acquisition among homeless female adolescents. *Child Abuse and Neglect*, *25*, 137–148.

Pao, M., Lyon, M., et al. (2000). Psychiatric diagnoses in adolescents seropositive for the human immunodeficiency virus. *Archives of Pediatrics and Adolescent Medicine*, *154*, 240–244.

Parillo, K.M., Freeman, R.C., et al. (2001). Association between early sexual abuse and adult HIV-risky sexual behaviors among community-recruited women. *Child Abuse and Neglect*, *25*, 335–346.

Paul, J.P., Catania, J., et al. (2001). Understanding childhood sexual abuse as a predictor of sexual risk-taking among men

who have sex with men: The Urban Men's Health Study. *Child Abuse and Neglect*, *25*, 557–584.

Petrak, J., Byrne, A., et al. (2000). The association between abuse in childhood and STD/HIV risk behaviours in female genitourinary (GU) clinic attendees. *Sexually Transmitted Infections*, *76*, 457–461.

Roy, A. (2001). Childhood trauma and attempted suicide in alcoholics. *Journal of Nervous and Mental Disease*, *189*, 120–121.

Seng, M.J. (1989). Child sexual abuse and adolescent prostitution: A comparative analysis. *Adolescence*, *24*(95), 664–675.

Sheldrick, C. (1991). Adult sequelae of child sexual abuse. *British Journal of Psychiatry*, *158*(Suppl. 10), 55–62.

Stewart, K.E., & Ross, D. (1999). Severe adverse life events and depressive symptoms among women with or at risk of HIV infection. *AIDS*, *13*(17), 2477–2478.

Strathdee, S.A., Hogg, R.S., et al. (1998). Determinants of sexual risk-taking among young HIV-negative gay and bisexual men. *Journal of Acquired Immune Deficiency Syndrome and Human Retrovirology*, *19*, 61–66.

Strathdee, S., Patrick, D., et al. (1997). Needle exchange is not enough: Lessons from the Vancouver Injecting Drug Users Study. *AIDS*, *11*(8), F59–F65.

Thakkar, R.R., Gutierrez, P.M., et al. (2000). History of physical and/or sexual abuse and current suicidality in college women. *Child Abuse and Neglect*, *24*, 1345–1354.

Vajda, J., & Steinbeck, K. (2000). Factors associated with repeat suicide attempts among adolescents. *Australian and New Zealand Journal of Psychiatry*, *34*, 437–445.

Wenzel, S.L., Koegel, P., et al. (2000). Antecedents of physical and sexual victimization among homeless women: A comparison to homeless men. *American Journal of Community Psychology*, *28*, 367–390.

Wingood, G.M., & DiClemente, R.J. (1997). Child sexual abuse, HIV sexual risk, and gender relations of African-American women. *American Journal of Preventive Medicine*, *13*, 380–384.

Young, T.K., & Katz, A. (1998). Survivors of sexual abuse: Clinical, lifestyle and reproductive consequences. *Canadian Medical Association Journal, , 329–*, *159*, 334.

Zanarini, M.C. (2000). Childhood experiences associated with the development of borderline personality disorder. *Psychiatric Clinics of North America*, *23*, 89–101.

Zierler, S., Witbeck, B., et al. (1996). Sexual violence against women living with or at risk for HIV infection. *American Journal of Preventive Medicine*, *12*, 304–310.