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HIV Prevalence and Sexual Risk Behavior among Non-Injection Drug Users in Tijuana, Mexico

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Abstract

Background—Prior studies estimate HIV prevalence of 4% among injection drug users (IDUs), compared with 0.8% in the general population of Tijuana, Mexico. However, data on HIV prevalence and correlates among non-injecting drug users (NIDUs) are sparse.

Methods—Individuals were recruited through street outreach for HIV testing and behavioral risk assessment interviews to estimate HIV prevalence and identify associated sexual risk behaviors among NIDUs in Tijuana. Descriptive statistics were used to characterize “low-risk” NIDUs (drug users who were not commercial sex workers or men who have sex with men).

Results—HIV prevalence was 3.7% among low-risk NIDUs. During the prior six months, 52% of NIDUs reported having ≥ 1 casual partner; 35% reported always using condoms with a casual partner; and 13% and 15% reported giving or receiving something in exchange for sex, respectively. Women were significantly more likely than men to have unprotected sex with an IDU ($p < 0.01$).

Conclusions—The finding that HIV prevalence among NIDUs was similar to that of IDUs suggests that HIV transmission has occurred outside of traditional core groups in Tijuana. Broad interventions including HIV testing, condom promotion and sexual risk reduction should be offered to all drug users in Tijuana.

Keywords

Non-injection drug use; HIV; sexual risk behavior; methamphetamine; Mexico

Introduction

HIV prevalence in Mexico is thought to be increasing¹ and is characterized by a disproportionate burden in border cities including Tijuana, where up to one in every 112 adults are HIV-infected.² The majority of reports suggest that the epidemic is concentrated primarily in core groups including injection drug users (IDUs),^{3,4} female sex workers (FSWs)⁵ and men who have sex with men (MSM).⁶ Tijuana’s location on a prominent drug

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trafficking route clearly influences the observed patterns of both drug use and HIV transmission.⁷ Studies of pregnant women and FSWs in Tijuana have found that non-injected use of methamphetamine was independently associated with HIV infection.^{5,8} To date, HIV risk among non-injecting drug users (NIDUs) in Tijuana has been relatively understudied.

An increasing body of evidence suggests that HIV prevalence has been increasing among NIDUs,^{9–13} which has been primarily attributed to sexual risk behaviors.¹⁴ Sexual risk-taking may particularly influence the transmission of HIV among women, who may frequently engage in sex work, and for whom sex trading for money or other goods may be more common.¹⁵ Drug use patterns may also indirectly influence HIV transmission: a Mississippi study comparing NIDUs with IDUs found that marijuana or cocaine use was associated with increased numbers of sexual partners.¹⁶ In addition, methamphetamine is frequently associated with increased sexual risk-taking.^{17–18}

The present study aimed to describe the prevalence of HIV and associated risk behaviors among NIDUs in Tijuana. Data for this study were obtained through Project PreveTB, a pilot TB/HIV screening and diagnosis program. Elsewhere, we report on the correlates of TB infection¹⁹ and HIV testing²⁰ among all study participants, which included selected comparisons of IDUs and NIDUs. To our knowledge, however, this study provides the first description of sexual risk and HIV prevalence estimates exclusive to NIDUs in Tijuana.

Methods

Study Population and Setting

The study took place between March and August, 2007 at the PrevenCasa, site of a harm reduction program and community health center located near Tijuana's quasi-legal commercial sex trade district. Study recruitment was conducted via street-based outreach and word-of-mouth advertising, partly facilitated through use of a modified recreational vehicle that operates as a mobile clinic.

Eligible participants were ≥ 18 years-old, able to provide informed consent and willing to return in 30 days for test results. In addition, participants had to report at least one of the following in the last six months: illicit drug use (other than marijuana), injection drug use, receipt of money/goods in exchange for sex, homelessness, or unstable housing, defined as living primarily in a rented hotel room, migrant work camp or medical/drug treatment facility. Participants were reimbursed \$15 USD for time and travel to participate in the study. Study methods were approved by the Institutional Review Board of the University of California, San Diego and the Ethics Board of the Tijuana General Hospital.

Data Collection and Laboratory Testing

Participants underwent face-to-face interviews in a private setting followed by pre-test counseling and venepuncture for HIV and TB serologic testing. Trained staff administered quantitative surveys using computer-assisted personal interviewing (CAPI) technology (Questionnaire Development System, Nova Research, Bethesda, MD) in Spanish to collect data on sociodemographics, drug use, sexual behavior, and HIV testing/treatment history. The survey instrument was developed in English, translated into Spanish and then back-translated into English to verify accuracy and meaning.

Participants were asked whether they had ever injected drugs or attended a drug treatment program and were also asked to describe patterns of drug use over the last six months. Specifically, we asked whether participants had used methamphetamine, heroin, heroin/methamphetamine combination (“goofball”), cocaine, marijuana, amphetamine,

benzodiazepines or hallucinogens, and which drug they most commonly used. Survey data relating to sexual behavior over the past six months included questions related to condom use, the number of casual partners and whether participants had a regular sexual partner.

HIV antibodies were detected on-site using the Abbott Determine HIV-1/2 Rapid test[®] (Abbott Laboratories, Abbott Park, Illinois). Positive samples were retested using enzyme-linked immunosorbant assay (ELISA) with confirmation by immunofluorescence assay (IFA) at the San Diego Department of Public Health Laboratory. Participants were instructed to return after 30 days to receive test results, post-test counseling, and referrals for medical care if indicated.

Data Analysis

NIDUs were defined as individuals who reported using an illicit drug in the last six months, but had never injected any drug in their lifetime. To determine whether risk of HIV infection was enhanced by membership in other risk groups, NIDUs were categorized as “high-risk” if they reported sex work as a primary source of income or were men who have sex with men (MSM), or “low-risk” if they reported neither. The present study has restricted analysis to the group of low-risk NIDUs. To identify factors associated with gender, Chi-square and Mann-Whitney statistics were used to assess nominal and continuous variables, respectively. P-values <0.05 were considered statistically significant. Univariate odds ratios are reported in these comparisons, as the limited sample size in this sub-group analysis precluded meaningful multivariate analysis.

Results

Demographics and Drug Use

Among 503 participants who met study eligibility criteria, 311 (62%) had used non-injected drugs in the last six months. Of these, 118 (38%) reported a history of injection drug use, leaving 193 NIDUs (38%) from the overall sample. Of these, 29 NIDUs were considered “high-risk” (15 were CSWs, 14 were MSM), leaving 164 low-risk NIDUs. The median age of these NIDUs was 34 years (interquartile range [IQR]:27–42), 45% were female, and 12% were homeless (Table 1). Methamphetamine was the most commonly used drug among low-risk NIDUs, with 87% reporting any use within the last six months and 84% reporting this as their most commonly used drug. Other commonly used drugs included marijuana (32%), heroin (9%), crack cocaine (7%), inhaled cocaine (9%) and benzodiazepines (7%). Male NIDUs were significantly more likely to have used heroin in the last six months than female NIDUs (14% vs 2.7%, $p<0.01$), but otherwise, drug use patterns were not significantly different between men and women in our survey (Table 1).

HIV Prevalence and Sexual Behavior

Overall, HIV prevalence among low-risk NIDUs was 3.7%. Only 36% of all low-risk NIDUs reported having previously been tested for HIV. Examining sexual behavior in the last six months, 52% of all NIDUs reported having one or more casual sex partners, and only 35% reported always using condoms during these encounters. In the last six months, 13% and 15% reported giving or receiving something in exchange for sex, respectively. In addition, 11% of all NIDUs reported having had unprotected sex with an IDU in the last six months. Methamphetamine use was not associated with increased sexual risk-taking in either group (data not shown).

Comparison by Gender

Among low-risk NIDUs, women were significantly less likely than men to be homeless (3% vs. 19%, $p<0.01$) and were more likely to have attended a drug treatment program (27% vs.

12%, $p < 0.05$) in their lifetimes. In the last six months, women were also significantly more likely to report having a regular sexual partner (50% vs. 21%, $p < 0.01$) or unprotected sex with an IDU (18% vs. 5%, $p < 0.01$). HIV prevalence among NIDUs did not significantly differ among low-risk female (2.7%) and male NIDUs (4.4%). Women and men also did not differ significantly with respect to condom use, payment of others for sex, or likelihood of having a casual sexual partner. No other variables considered differed significantly by gender.

Discussion

HIV prevalence among NIDUs in Tijuana was over four times higher than the general population,² suggesting that HIV transmission has occurred outside of traditional core groups. HIV prevalence among NIDUs with no other HIV-associated risk (3.7%) was similar to that among IDUs in Tijuana (4%).^{3, 4} Based on our observations, HIV transmission among NIDUs is most likely explained by high levels of sexual risk-taking in the context of shared network characteristics which influence the dynamics of HIV transmission among Tijuana drug users. However, additional studies are needed to delineate risk factors for HIV infection in this population.

The concept of bridging populations suggest that drug users and their sexual partners may be at increased risk for HIV through shared network characteristics.⁷ The setting of Tijuana, Mexico provides a unique bridge through sexual networks which include female sex workers and their Mexican and American clients.²¹ While we did not formally study the social networks of Tijuana NIDUs, this group often shares social space with members of other high-risk groups, which has implications for both transmission and HIV prevention efforts. Studies from developing countries have found that NIDUs are less aware of their own HIV status²⁰ or how HIV is transmitted,²² suggesting that NIDUs have not benefited from interventions aimed at other high-risk groups such as IDUs or CSWs.

Overlap in HIV-associated risk behaviors further suggests that NIDUs are active in a number of social networks, which has implications for HIV transmission.²³ A study utilizing respondent-driven sampling—a method that allows researchers to calculate unbiased estimates by linking subjects within the study to other subjects referred by them—found that IDUs and NIDUs commonly referred one another to the study.¹¹ Network size and characteristics may also influence HIV-associated risk.²⁴ A study from Baltimore found that NIDUs with larger network size, or with non-sex partner IDUs in their network, were more likely to have one or more IDU sex partners.²⁵ Similarly, Pilowsky and colleagues found that networks which included a high proportion of individuals providing, receiving or using drugs increased the risk of members' engaging in high-risk sexual behaviors.²⁶ The networks are highly dynamic: NIDUs frequently transition or relapse into injection drug use, which itself confers additional risk via parenteral contact, as infrequent or occasional injectors may be more likely to share syringes when they do inject.²⁷ Future studies of social networks of HIV-positive NIDUs in the Mexico-U.S. border region would provide insight into the potential for further diffusion of HIV in Tijuana and among mobile populations that cross the U.S. border.

Among important sexual risk determinants, NIDUs reported high levels of multiple casual partners and low levels of condom use, particularly when sex was exchanged for money/goods. In fact, among individuals who reported sex trade, less than one-third always used condoms in these encounters. These sexual risk behaviors parallel reports from other developing countries: 53% of NIDUs in Bangladesh reported having sex with CSWs within the previous month, and 96% of their most recent encounters included unprotected sex.²⁷ In our study, some behavior may be attributable to the overlap between sex work and non-

injection drug use, as CSWs tended to report higher numbers of sexual partners. Nonetheless, even when examining NIDUs who were not CSWs or MSM, overall levels of sexual risk-taking remained high.

Women in our study were significantly more likely than men to have had sex with an IDU or received something in exchange for sex. These findings parallel other studies that reported greater frequency of sexual exchange and IDU sexual partners among women than men.^{25, 28} While HIV prevalence among NIDUs did not significantly differ by gender in our study, a Spanish study found that female NIDUs had higher HIV prevalence than male NIDUs, suggesting the potential for increased vulnerability among drug-using women who may be unaware of their partner's drug and sexual risk behaviors.²⁸ In general, women have been found to have greater overlap between members of their drug use and sexual networks relative to men, also placing them at higher risk of acquiring HIV and other STDs.¹⁰ The low levels of condom use reported among all types of partners suggest that Tijuana drug-using women are at similarly elevated risk for HIV acquisition.

Certain limitations should be considered when interpreting the results of this study. The current study is a sub-group analysis from a parent study (PreveTB), resulting in a small sample size. Our study population was selected through a convenience sample and was therefore non-random. It is possible that individuals misrepresented their risk behaviors, either in hopes of gaining access to the study, or because of stigma associated with their responses. However, because both IDUs and NIDUs were eligible, it is unlikely that participants misrepresented their injection status. Finally, our study was based on cross-sectional data, precluding our ability to draw causal inferences between HIV prevalence/sexual risk and non-injection drug use. These limitations notwithstanding, the HIV prevalence estimates obtained through this sample, reported elsewhere,²⁰ are consistent with previous estimates from studies of Tijuana sub-populations.^{3-6, 21}

The findings of this study have implications for the design of interventions aimed at reducing the spread of HIV in Tijuana and similar settings. NIDUs potentially encounter fewer opportunities for HIV prevention in Tijuana because they may not be recognized as members of a high-risk group; thus, efforts should be made to target this group, either at drug treatment facilities or through intensified outreach. The fact that HIV prevalence is high in this bridge population could suggest that Tijuana is moving from a concentrated to a generalized HIV epidemic. Broad interventions including HIV testing, condom promotion and sexual risk reduction should be offered to all drug users in Tijuana. Future studies to increase understanding of transmission bridges among drug using populations in Tijuana are warranted.

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Demographic characteristics, HIV prevalence and selected drug use and sexual risk characteristics among low-risk[§] non-injection drug users (NIDUs) with comparison by gender

Table 1

	Total (N=164) %	Men (N=90) %	Women (N=74) %	Odds Ratios (95% CI)*	P-value
General characteristics					
Median Age (IQR)	34 (27,42)	36 (30,44)	30 (23,37)	NS	NS
Completed secondary school education	44	40	49	NS	NS
Earn more than 3,000 pesos (\$275) monthly	21	22	20	NS	NS
Homeless	12	19	3.2	0.1 (0.03, 0.5)	0.001
HIV and Testing/Treatment					
HIV-positive	3.7	4.4	2.7	NS	NS
Have received prior HIV Test	36	39	32	NS	NS
Attended drug treatment program	19	12	27	2.7 (1.2, 6.0)	0.02
Drug Use Patterns in last 6 months					
Daily drug use	47	43	51	NS	NS
Daily alcohol use	12	12	12	NS	NS
Used marijuana	32	36	27	NS	NS
Used methamphetamine	88	89	88	NS	NS
Used heroin	9.1	14	2.7	6.1 (1.3, 28)	0.009
Sexual Behavior in last 6 months					
Had unprotected sex with known HIV+ partner	0.6	0	1.3	NS	NS
Had unprotected sex with IDU	11	5	18	4.7 (1.4, 15)	0.01
Had regular sex partner	34	21	50	3.7 (1.9, 7.3)	0.01
Always used condoms with regular partner ^a	11	16	8.1	NS	NS
Had ≥1 casual partner	52	52	51	NS	NS
Always used condom with casual partner ^b	35	41	26	NS	NS
Gave something in exchange for sex	13	17	8	NS	NS
- Always used condoms in these encounters ^c	29	40	0	NS	NS
Received something in exchange for sex	15	11	19	NS	NS
- Always used condoms in these encounters ^d	42	40	43	NS	NS

§ Low-risk refers to NIDUs who were neither sex workers nor men who have sex with men.

* NS = non-significant ($p \geq 0.05$).

^a N=56, N=19 and N=37 for total, males, and females respectively.

^b N=85, N=47 and N=38 for total, males, and females respectively.

^c N=21, N=15 and N=6 for total, males, and females respectively.

^d N=24, N=10 and N=14 for total, males, and females respectively.