ABSTRACT

Objectives: To determine the demographic characteristics, risk behaviours and prevalence of HIV-1 among injection drug users (IDU) attending Calgary's needle exchange program (NEP).

Methods: A survey was conducted from June through September 1998 among IDU attending Calgary's NEP. Demographic and behaviour characteristics were determined by personal interview and saliva was tested for HIV antibody.

Results: There were 278 participants providing 272 saliva specimens. Nine were positive for HIV-1 (3.3%, 95% C.I. 1.6-6.4%). Sexual and injecting practices, cities where drugs had been used, incarceration, addiction treatment and demographic characteristics were described, and a subanalysis for women, youth and Aborigines was carried out.

Conclusions: HIV prevalence remains low among NEP attenders in Calgary, although high-risk behaviours are common. Women, youth and Aborigines have unique risk behaviour profiles. Many IDU want to participate in addiction treatment, and strategies should be made to provide accessible, appropriate treatment services.

ABRÉGÉ

Objectif : déterminer la prévalence de la séropositivité au VIH-1, les caractéristiques démographiques et les comportements à risque chez les usagers de drogues injectables (UDI) qui fréquentent le programme d'échange de seringues de Calgary.

Méthodes : on a procédé à une enquête de juin à septembre 1998 chez les UDI fréquentant le programme de Calgary. Les caractéristiques démographiques et comportementales ont été déterminées à partir d'entrevues personnelles et de test de dépistage des anticorps anti-VIH dans la salive.

Résultats : 278 participants ont fourni 272 échantillons de salive. Neuf se sont avérés positifs au VIH-1 (3,3 %, IC de 95 %, 1,6 - 6,4 %). On a recensé les pratiques sexuelles et d'injection, les villes où la drogue avait été consommée, les épisodes d'incarcération, les traitements de désintoxication suivis et les caractéristiques démographiques, et on a également fait des sous-analyses pour les femmes, les jeunes et les autochtones.

Conclusions : la prévalence au VIH reste faible parmi les UDI du programme de Calgary en dépit du fait que les comportements à risque élevé soient courants. Les femmes, les jeunes et les autochtones présentent des profils de comportement à risque tout particuliers. Bon nombre d'UDI souhaitent bénéficier d'un traitement de désintoxication, et des stratégies devraient être prévues pour fournir des services de traitement accessibles et adéquats.

HIV Prevalence Remains Low Among Calgary's Needle Exchange Program Participants

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Harm reduction approaches such as needle exchange programs have been promoted as important components of HIV prevention strategies for injection drug users (IDU).¹ Needle exchange programs (NEP) have been operating in many Canadian cities since the late 1980s. In Calgary, the NEP has been active since 1990. There were 1,800 individual clients registered with the NEP between January 1995 and December 1997 and 416,000 syringes were exchanged in 1998, with numbers increasing annually.² At the time of this study, trained nurses at one clinic site and one mobile van provided counselling, primary health care and vaccinations, condoms and referral services in addition to sterile syringes. An estimate of the number of IDU in Calgary in 1996 was 3,540.³ This estimate is likely to be conservative, and it is not known what proportion of these individuals use the NEP.

The only survey thus far of HIV prevalence and behaviour characteristics among IDU in Calgary took place in 1992, when prevalence was estimated at 2.2% among a sample of 103 clients of the NEP who volunteered to participate in a one-hour survey.⁴ Data from other Canadian cities suggest that increases in incidence and prevalence have occurred among IDU since the epidemic began, and that high-risk behaviours have remained common.^{5,6}

The purpose of the current study was to estimate HIV prevalence among IDU attending the NEP, and to characterize the demographic and behavioural features within this population, utilizing a brief survey instrument and HIV testing that could be integrated into the routine of NEP client services.

METHODS

Study approval was obtained from the Conjoint Health Research Ethics Board of the Faculty of Medicine, University of Calgary. Volunteers were recruited from June through September 1998 through the NEP. Clients seeking needle exchange or other services at the van or fixed site were invited to participate if they had injected drugs within the preceding 3 months, if they had not participated in the same study previously, and if they appeared capable of providing informed consent and answering a 10-minute questionnaire by personal interview.

Following informed consent, questionnaires were administered by the nursing staff of the NEP at the time when the client presented for services. A saliva specimen was collected for HIV-antibody testing.^{7,8} Specimens were linked to questionnaires by numerical code. The semi-structured questionnaire included 26 questions on demographics, sexual behaviour, drug-using behaviour, incarceration and previous addiction treatment. Participants were counselled that results of saliva testing would not be made available to them, and were offered voluntary counselling and blood testing at the time of the study or at their convenience. They were offered their choice of a meal voucher or five city transit tickets for their participation.

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Saliva samples were collected using the Omni-Sal saliva collection device (Saliva Diagnostics Systems, Vancouver, WA, USA). Samples were stored at 4°C prior to transportation to the Provincial Laboratory of Public Health, which occurred within 24 hours. Saliva was tested within 24 hours of receipt.

Saliva was screened for the presence of HIV-1 and -2 antibody using the IAF BioChem Detect HIV 1/2 enzyme immunoassay kit (BioChem Immunosystems, Montreal, Quebec, Canada). Repeatedly reactive samples were then tested by the Genetics HIV 1/2 EIA kit (Genetics Systems Corporation, Redmond, WA). Those with repeatedly high values were regarded as presumptive positives.⁹ Only those with high values in the IAF BioChem kit and negative in the Genetics kit were tested by Western Blot (Cambridge Biotech, Rockville, MD).

Data were analyzed using the Statistical Program for Social Sciences (SPSS version 7.5) software. Chi-square test (with Fisher's Exact and Yates' Continuity Correction when appropriate) was used to determine the statistical significance of differences in proportions for various subgroups.

RESULTS

HIV prevalence

Of the 278 study participants, 272 submitted adequate saliva specimens for assay of HIV-1 and -2 antibodies by EIA. Nine were positive for HIV-1 by the algorithm described above, resulting in an overall prevalence of 3.3% (95% C.I. 1.6-6.4%). Only surveys from the 272 participants with adequate saliva specimens were analyzed further.

Demographic profile

Table I summarizes demographic characteristics for the 272 study participants whose HIV status was determined. The mean age was 35.9 years, and 91% were 25 years or older. Twenty-one percent were female and 20% were Aboriginal. Seventy-three percent of participants had attended the NEP on at least one occasion prior to the study, and 38% had attended more than 10 times in the previous 6 months.

Forty-four percent had been incarcerated at some point in the previous 6 months. The mean duration of incarceration was 3.6 weeks, with a maximum of 16 weeks.

Drug use behaviours

Injection of drugs began at a mean age of 22.4 years (Table II) and 10% had started within the year prior to the study. The primary source for obtaining injection equipment was reported as NEPs by 63% and pharmacies by 23%. Borrowing of used injection equipment was reported infrequently, with 75% indicating they had not borrowed in the previous 6 months. The primary drug of injection was cocaine for 60%, followed by morphine for 26% and heroin for 7%. When asked what other drugs were injected, an additional 28% reported cocaine. Other drugs injected included meperidine, codeine, pentazocine, methylphenidate and amphetamines. Fifty-two percent stated that they wanted to be in addiction treatment. Seventy-five percent had participated in some form of addiction treatment during their lifetime (including detoxification, outpatient or residential programs and methadone treatment), and 68% had tried to quit drug use in the preceding 6 months (either on their own or through a program).

Sexual behaviour

Eighty-three percent of study volunteers reported being sexually active in the previous 6 months, including oral, anal or vaginal intercourse (Table III). Among those who were sexually active, 27% used a condom for every event and 37% reported never using condoms. Among the sexually active men, 7% reported having had sex with men in the preceding 6 months (either exclusively or in addition to sex with women). Among sexually active women, 12% reported having had sex with women. Of the sexually active participants, 20% had participated in sexual activity for trade in the preceding 6 months.

Special demographic groups

A subanalysis was conducted for women, Aboriginals and youth under age 25 for all behavioural variables. Sixty-eight percent of women used injection drugs only in

TABLE I
Demographic Characteristics of Study Participants (N=272)

	N	%
Mean age (range)	35.9 (18-55)	—
Age <25 years	25	9
Female	56	21
Ethnic Background		
Caucasian	204	75
Aboriginal	54	20
Other	14	5
First time attending NEP	74	27
Incarcerated in past 6 months	119	44

Calgary, compared with 53% of men. Ninety-five percent of women were sexually active, compared with 81% of men, and 50% of sexually active women were involved in sex for trade compared with 10% of sexually active men. These differences were statistically significant at $p < 0.05$ by chi-square test.

Aboriginals were significantly less likely ($p < 0.05$) to have borrowed injection equipment, with 85% reporting never borrowing compared with 73% of non-Aboriginals. They were also significantly more likely to be sexually active (93% vs. 81%). There was a trend toward cocaine use as primary drug (62% vs. 55%) and more involvement in sex trade (29% vs. 17%), but these were not statistically significant.

Regular condom use was significantly greater in those under age 25 than those age 25 and over (46% vs. 25%). There was a trend for youth to report more use of drugs outside of Calgary (52% vs. 43%), more borrowing of injecting equipment (46% vs. 24%), greater use of cocaine as primary drug (64% vs. 55%) and greater sexual activity (96% vs. 82%), although these did not reach statistical significance.

DISCUSSION

This study utilized a convenience sample drawn from NEP attenders and as such is unlikely to be representative of the general IDU population in Calgary. Studies in other cities have shown NEP attenders to differ from non-attenders in factors such as age, income, involvement in sex trade, HIV prevalence and sharing of equipment, among others.⁵ Results from this survey cannot be generalized beyond the study sample.

TABLE II
Drug-using Behaviour in Previous 6 Months (N=272)

	N	%
Mean age (range)	35.9 (18-55)	—
Mean age of initial injection (range)	22.4 (1-55)	—
Cities where drugs injected in past 6 months		
Calgary only	154	57
Calgary and other Alberta communities only	29	11
Calgary, Vancouver and any others	45	17
Calgary and others, not including Alberta and Vancouver	44	16
Primary sources for injection equipment		
Needle exchange programs	171	63
Pharmacies	62	23
Borrowed injecting equipment		
Never	204	75
Primary drug injected		
Cocaine	164	60
Morphine	71	26
Heroin	19	7
Other	18	7
Secondary drugs injected*		
None	80	29
Cocaine	75	28
Morphine	54	20
Heroin	32	12
Want addiction treatment	141	52

* More than one drug could be listed by participant, and only the 3 most common are given here.

TABLE III
Sexual Behaviour in Previous 6 Months (N=272)

	N	%
Sexually active	226	83
Sexually active men (percent of total men)	174	81
Sexually active women (percent of total women)	53	95
Men having sex with men (percent of sexually active men)	12	7
Women having sex with women (percent of sexually active women)	9	17
Condom use (percent of sexually active participants)		
Every time	62	27
Most times	46	20
Sometimes	35	15
Never	83	37
Sex for trade (percent of sexually active participants)	45	20

In Montreal and Vancouver, HIV prevalence in NEP attenders was observed to be higher than that in non-attenders.^{5,6} Thus, our observed prevalence of 3.3% may overestimate the actual prevalence in Calgary's IDU population. This proportion is low relative to many other North American cities, and may reflect differences in factors such as drug availability and cost, regional economic trends, injection behaviours and geographic concentration of drug use within a city. A survey using saliva testing among 100 NEP attenders in Edmonton in 1997 revealed a prevalence of 7%.¹⁰ Vancouver experienced an outbreak of HIV among IDU beginning in 1995, when the incidence was 18.6 per 100 person-years, the highest reported for any city in North America.⁵ Prevalence rose to 23% from an estimated baseline of 1-2%. In Montreal, where the epidemic was established earlier, prevalence was 16% among

NEP attenders enrolled in a cohort between 1988 and 1995, with an incidence of 7.9 per 100 person-years.⁶ Although it is well recognized that the HIV epidemic takes on different characteristics among drug-using populations in different cities, the factors contributing to these differences have not been well described. An analysis of the factors that may be protective in a population such as that in Calgary would be timely.

Although a minority in our sample were Aboriginal or under age 25, it is impossible to speculate on whether this is reflective of the true proportions among NEP attenders or the larger IDU population. The majority of our sample had injected drugs only in Calgary during the previous 6 months, possibly reflecting a degree of geographic stability. The most common additional city where drugs were injected was Vancouver, 800 km away, suggesting a

path of migration between the two cities. Almost half of the sample had been incarcerated during the preceding 6 months, highlighting a high crime rate that may be driven by the need to acquire drugs.

We observed infrequent borrowing of injecting equipment and a low level of regular condom use. There may be a tendency for reporting to be unreliable for sexual and injecting risk behaviours, since participants were being interviewed by the same nurses who provide risk reduction education. However, in light of this, it is noteworthy that reported regular condom use remained low, and 'never using condoms' remained high. Drugs of preference appear to vary from city to city, in part related to the prevailing market. In our sample, cocaine was the preferred drug, in keeping with the trend among other Canadian cities.^{5,6,10} However, IDU in Calgary appear to be unique in their preference for injecting prescription morphine. Edmonton, for example, has a low rate of morphine use and a high rate of injection of Talwin and Ritalin.¹⁰ Reasons for varying patterns of drug use have not been investigated to our knowledge. We found that about half of our sample participants wished to participate in addiction treatment.

Risk factors for HIV transmission appear to differ among various demographic subgroups. A greater involvement in the sex trade and greater probability of being sexually active may put female IDU at higher risk for contracting HIV than men. However, women were also less likely to inject drugs outside of Calgary, which may be protective. Youth were significantly more likely than those over age 25 to use condoms, but there was also a trend toward injecting in cities outside Calgary, being sexually active, borrowing injecting equipment and using cocaine. Aboriginal participants were more likely to be involved in sex trade and less likely to borrow injection equipment. These characteristics may highlight important issues for more targeted HIV prevention strategies.

Low prevalence of HIV among NEP attenders in Calgary is encouraging, and demonstrates that all IDU populations have not been affected by the epidemic to the same degree. Although specific public

health measures may have contributed to a low prevalence of HIV, the mechanisms involved are likely more complex. It is interesting to note that methadone treatment for opiate addiction has not been available in Calgary since the HIV epidemic began. Understanding what factors may be protective among some populations would be valuable. Implementing aggressive prevention strategies now has the potential to stem an increase in incidence in Calgary. Further study should be carried out to determine what forms of treatment would be most appropriate, and how to make these accessible.

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