

Requiring Help Injecting as a Risk Factor for HIV Infection in the Vancouver Epidemic

Implications for HIV Prevention

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ABSTRACT

Background: Requiring help injecting was recently associated with syringe sharing, and later HIV-1 and HCV seroconversion among injection drug users (IDU) in Vancouver. This risk factor remains poorly understood. The present study investigates this risk factor among Vancouver IDUs.

Methods: We evaluated factors associated with requiring help injecting among participants enrolled in the Vancouver Injection Drug User Study (VIDUS) using univariate and logistic regression analyses. VIDUS participants who were followed-up during the period December 2000 to December 2001 were eligible for the present analyses. We also evaluated self-reported reasons for requiring help injecting.

Results: Overall, 661 active injection drug users were interviewed during the study period. Among this population, 151 (22.8%) had required help injecting during the last six months, whereas 510 (77.2%) indicated that they had not. Variables that were independently associated with requiring help injecting included borrowing a used syringe (adjusted odds ratio [AOR] = 2.18), frequent cocaine injection (AOR = 1.57), and female gender (AOR = 2.29). Among males, the most common reasons for requiring help injecting were: having no viable veins (77.1%), and anxiousness or being drug sick (42.9%). Among females, the most common reasons reported were: having no viable veins (71.6%), jugular injection or 'jugging' (45.7%), and being anxious or drug sick (27.2%). Almost twice as many females (13.6% vs 7.1%) reported not knowing how to inject as their reason for requiring help injecting.

Conclusion: Although current public health approaches, such as needle exchange, are unable to address the concerns associated with requiring help injecting, available evidence suggests that safer injecting facilities have the potential to substantially mitigate this risk behaviour.

La traduction du résumé se trouve à la fin de l'article.

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Acknowledgements: Evan Wood is supported by the Canadian Institutes of Health Research (CIHR), the George F. Elliot Foundation, and the BC Health Research Foundation. Martin Schechter is a Canadian Institutes of Health Research Senior Investigator. We also thank Bonnie Devlin, John Charette, Kathy Churchill, Caitlin Johnston, Robin Brooks, Steve Kain, Guillermo Fernandez, Peter Vann, and Nancy Laliberte for their research and administrative assistance; and all the participants in the VIDUS study.

Since the mid-1990s, the Downtown Eastside of Vancouver, British Columbia, has experienced an explosive and ongoing HIV-1 epidemic among injection drug users.^{1,2} The HIV epidemic was particularly troubling because it occurred in the presence of a large needle exchange program (NEP), which had been ranked among the top three in North America by the U.S. Centers for Disease Control and Prevention based on the number of syringes exchanged and the estimated number of IDUs reached.³

The explosive outbreak was interpreted by some to suggest that needle exchange programs may promote the spread of HIV.⁴⁻⁶ Subsequently, this interpretation was shown to be false, and the epidemic has been attributed to specific local factors including the high prevalence of cocaine injection, and difficulty accessing syringes among the city's injection drug users.⁷⁻⁹ In addition, we have also recently demonstrated that requiring help injecting was among the strongest risk factors for syringe sharing among IDU in Vancouver, and in response it was argued that safer injecting facilities should immediately be evaluated as a strategy to address this source of potential blood-borne disease spread.¹⁰⁻¹² Requiring help injecting was subsequently associated with both HIV-1¹³ and hepatitis C (HCV)¹⁴ among IDU in the city.

At present, little is known about requiring help injecting as a risk for blood-borne disease transmission. In an effort to help inform a public health response and to better examine this risk factor, the present analyses were conducted to evaluate socio-demographic and behavioural characteristics associated with requiring help injecting and to evaluate self-reported reasons for requiring help injecting among IDU in Vancouver.

METHODS

Beginning in May 1996, persons who had injected illicit drugs in the previous month were recruited into the Vancouver Injection Drug User Study (VIDUS), a prospective cohort study that has been described in detail previously.^{3,15} Briefly, persons were eligible for the VIDUS study if they had injected illicit drugs at least once in the previous month, resided in the greater Vancouver region, and provided written informed consent. At baseline and

semi-annually, subjects provided blood samples and completed an interviewer-administered questionnaire. Participants receive \$20 for each study visit. The questionnaire elicits demographic data as well as information about drug use, HIV risk behaviour, and drug treatment. The study has been approved by the University of British Columbia's Research Ethics Board. The present analyses are restricted to those participants who completed a follow-up visit during the period December 2000 to December 2001.

Univariate and multivariate statistical techniques were applied to determine factors associated with requiring help injecting. Socio-demographic characteristics considered in the analyses included: gender, ethnic background (Aboriginal versus other), HIV sero-status, age, unstable housing, accidental overdose, residence in the Downtown Eastside HIV-epicentre, and sex trade work.

Behavioural and drug use variables, regarding activities in the last six months, included: whether participants reported that they currently find it hard to get clean needles, injecting in public, frequency of cocaine and heroin injection, average needle re-use, syringe borrowing, bingeing, and injecting alone. As in our previous work,^{13,16} persons who reported injecting cocaine or heroin once or more per day were defined as frequent cocaine and frequent heroin users respectively.

Statistical analyses were applied to compare participants who reported requiring help injecting to participants who did not report this risk factor. Categorical explanatory variables were analyzed using Pearson's Chi-square test and continuous variables were analyzed using the Wilcoxon rank sum test. We then fit a logistic regression model to evaluate variables that were independently associated with this risk behaviour. All reported p-values are two-sided.

Finally, for all persons who reported requiring help injecting, the interviewer then asked each participant why they have required help injecting during the last six months. The interviewer did not read out a list of possible explanations, but had a list of 7 possible responses, which were developed through prior piloting of this question, as well as space to note answers that did not fit with one of the 7 categories.

TABLE I**Univariate Analyses of Study Participants' Socio-demographic Characteristics Stratified by Those that Did and Did Not Report Requiring Help Injecting**

Characteristic	Required Help Injecting No n (%)	Required Help Injecting Yes n (%)	Unadjusted Odds Ratio	(95% C.I.)	p-value
Gender					
Male	332 (65.1)	70 (46.4)	2.2	(1.5 – 3.1)	0.001
Female	178 (34.9)	81 (53.6)			
Ethnic Background					
Other	358 (70.2)	104 (68.9)	1.1	(0.7 – 1.6)	0.756
Aboriginal	152 (29.8)	47 (31.1)			
HIV Positive					
No	341 (66.9)	98 (64.9)	1.1	(0.8 – 1.6)	0.654
Yes	169 (33.1)	53 (35.1)			
Age (years)					
Median	39	40	1.00	(0.98 – 1.03)	0.474
Interquartile Range	32-46	31-46			
Unstable Housing					
No	246 (48.2)	72 (47.7)	1.0	(0.7 – 1.5)	0.905
Yes	264 (51.8)	79 (52.3)			
Accidental Overdose*					
No	426 (83.5)	121 (80.1)	1.3	(0.8 – 2.0)	0.332
Yes	84 (16.5)	30 (19.9)			
Downtown Eastside Residence					
No	207 (40.6)	57 (37.8)	1.1	(0.8 – 1.6)	0.531
Yes	303 (59.4)	94 (62.3)			
Sex Trade Work*					
No	321 (62.9)	72 (47.7)	1.9	(1.3 – 2.7)	0.001
Yes	189 (37.1)	79 (52.3)			

* refers to the last six months at time of interview.

TABLE II**Univariate Analyses of Study Participants' Drug Use and Behavioural Characteristics Stratified by Those that Did and Did Not Report Requiring Help Injecting**

Characteristic	Required Help Injecting No n (%)	Required Help Injecting Yes n (%)	Unadjusted Odds Ratio	(95% C.I.)	p-value
Hard to get Needles*					
No	414 (81.2)	110 (72.9)	1.6	(1.1 – 2.5)	0.027
Yes	96 (18.8)	41 (27.2)			
Inject in Public*					
No	385 (75.5)	117 (77.5)	0.9	(0.6 – 1.4)	0.615
Yes	125 (24.5)	34 (22.5)			
Cocaine Use Frequency*					
< 1 per day	398 (78.0)	107 (70.9)	1.5	(1.0 – 2.20)	0.068
≥ 1 per day	112 (22.0)	44 (29.1)			
Heroin Use Frequency*					
< 1 per day	340 (66.7)	98 (64.9)	1.1	(0.7 – 1.6)	0.687
≥ 1 per day	170 (33.3)	53 (35.1)			
Average Needle Use*					
Once	360 (70.6)	118 (78.2)	0.7	(0.4 – 1.0)	0.068
Greater than Once	150 (29.4)	33 (21.9)			
Borrowed Syringe*					
No	451 (88.4)	117 (77.5)	2.2	(1.4 – 3.5)	0.001
Yes	59 (11.6)	34 (22.5)			
Bingeing*					
No	374 (73.3)	110 (72.9)	1.0	(0.7 – 1.5)	0.906
Yes	136 (26.7)	41 (27.2)			
Injecting Alone*					
No	126 (24.7)	58 (38.4)	0.5	(0.4 – 0.8)	0.001
Yes	384 (75.3)	93 (61.6)			

* refers to the last six months at time of interview.

Participants were able to provide more than one explanation.

RESULTS

A total of 926 participants completed a follow-up during the period December 2000 to December 2001. Of these, 265 (28.6%)

participants were excluded from the analysis because they were not actively injecting at the time of their most recent follow-up. Therefore, 661 participants were eligible for the present study. Among this population, 151 (22.8%) had required help injecting during the last six months, whereas 510 (77.2%) indicated that they

TABLE III
Logistic Regression Analysis* of Factors Associated with Requiring Help Injecting

Variable	Adjusted Odds Ratio	95% Confidence Interval	p-value
Inject Alone (Yes versus No)	0.60	(0.40 – 0.89)	0.012
Borrowed Used Syringe (Yes versus No)	2.18	(1.34 – 3.54)	0.002
Gender (Female versus Male)	2.29	(1.54 – 3.40)	<0.001
Frequent Cocaine Injection* (Yes versus No)	1.57	(1.03 – 2.40)	0.036

* behaviours refer to the last six months. Model was also adjusted for age.

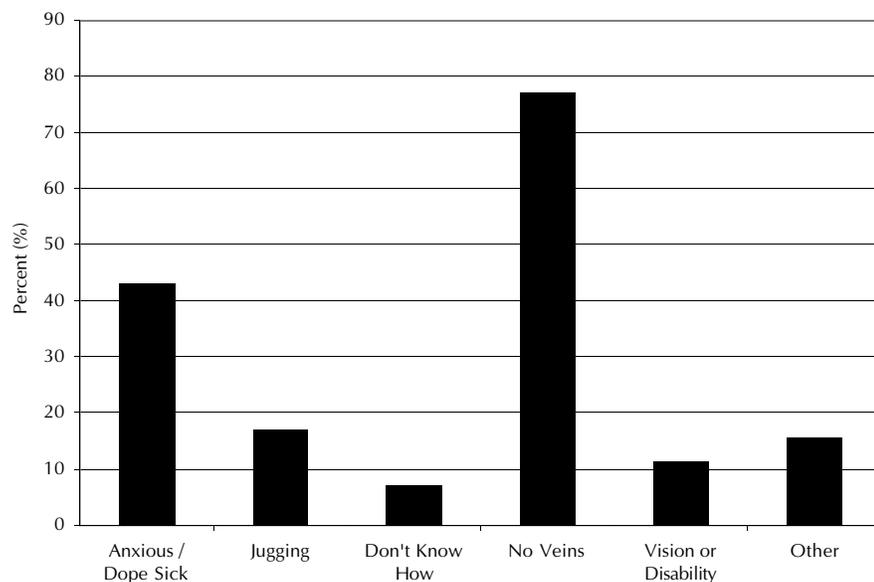


Figure 1. Reasons for requiring help injecting among male IDU in the Vancouver Injection Drug Users Study.

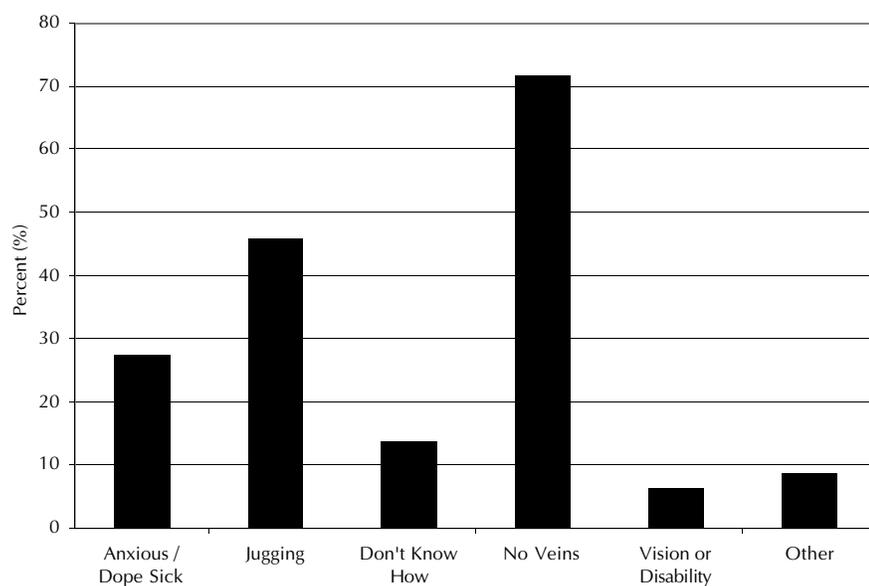


Figure 2. Reasons for requiring help injecting among female IDU in the Vancouver Injection Drug Users Study.

had not required help injecting. Overall, in comparison to the 512 study participants who were not included in the present study, participants included in this analysis were more likely to be female, Aboriginal, to live in unstable housing, and to be older (all $p < 0.01$). We detected no statistical difference between these groups with regard to requiring help injecting ($p > 0.1$).

The univariate analysis of socio-demographic characteristics of study participants is shown in Table I. As shown here, female gender (OR = 2.2) and sex trade work in the last six months (OR = 1.9) were positively associated with requiring help injecting. We found no evidence that ethnic background, HIV positivity, age, unstable housing, having had an accidental overdose in the last six months, or residence in the HIV epicentre were associated with requiring help injecting.

Univariate analyses of drug use-related variables are shown in Table II. As shown here, difficulty accessing clean needles (OR = 1.6) and borrowing a used syringe (OR = 2.2) were positively associated with requiring help injecting, whereas injecting alone was negatively associated with requiring help injecting (OR = 0.5). Although not achieving conventional statistical significance, both frequent cocaine use and using syringes more than once on average were marginally associated with requiring help injecting. We found no evidence that injecting in public, frequent heroin injection, and bingeing were associated with requiring help injecting.

Variables that were independently associated with requiring help injecting are shown in Table III. As shown here, borrowing a used syringe (adjusted odds ratio [AOR] = 2.18; [95% CI 1.34 – 3.54]), frequent cocaine injection (AOR = 1.57; [95% CI 1.03 – 2.40]), and female gender (AOR = 2.29; [1.54 – 3.40]), all remained positively associated with requiring help injecting in multivariate analyses. Conversely, injecting alone remained negatively associated with requiring help injecting in multivariate analyses (AOR = 0.60; [95% CI 0.40 – 0.89]). The final model was also adjusted for age.

Self-reported reasons for requiring help injecting among the 70 male IDU that reported this risk factor are shown in Figure 1. As shown here, the most common reasons for requiring help injecting

were having no viable veins (77.1%), and shaky hands due to anxiousness and/or being drug sick (42.9%). Only 7.1% of males attributed requiring help to not knowing how to inject. Reasons for requiring help injecting among the 81 females that reported this risk factor are shown in Figure 2. As shown here, the most common reasons for requiring help injecting were having no viable veins (71.6%), being injected in the jugular vein or 'jugging' (45.7%), and shaky hands due to anxiousness and/or being drug sick (27.2%). We also noted that almost twice as many females (13.6% vs 7.1%) reported not knowing how to inject as their reason for requiring help injecting. Percentages add up to more than 100% because participants could attribute requiring help to more than one reason.

DISCUSSION

We found that 23% of IDU required help injecting during the last six months. Variables that were independently associated with requiring help injecting included borrowing a used syringe, frequent cocaine injection, and female gender. Interestingly, both males and females attributed requiring help to having no viable veins in their arms as well as anxiousness and/or dope sickness. However, females were more likely to report 'jugging' as well as not knowing how to inject themselves.

The strong association between requiring help injecting and female gender, as well as the risk factors for requiring help injecting among women, demonstrate the limitations of Canada's public health interventions for the problems of injection drug use.^{13,17} Females had a greater than twofold risk of requiring help injecting in adjusted analyses, and self-reported reasons for requiring assistance, such as not knowing how to inject and 'jugging,' may not be amenable to improvement through traditional interventions such as needle exchange programs. It is important to note that the questionnaire is limited in its ability to adequately inform reasons for certain associations, such as the association between sex-trade work and requiring help injecting, and qualitative studies would be valuable to address these issues further.

Within the context of the current public health programs, such as needle exchange,

this risk factor may be next to impossible to mitigate.³ However, an intervention that has been successfully implemented elsewhere and may have substantial potential to mitigate this risk behaviour is safer injecting facilities (SIF), where IDU can inject pre-obtained illicit drugs under the supervision of trained staff to prevent syringe sharing. SIFs have been credited with improving the health and social functioning of their clients,¹⁸ while reducing overdose deaths,¹⁹ HIV risk behaviour,²⁰ improperly discarded syringes,²¹ and public drug use.²² In addition, improved knowledge of safer injecting practices,²³ as well as improved access to medical care and drug treatment, have been attributed to SIF attendance.^{24,25}

SIFs may have the substantial potential to reduce this risk behaviour for several reasons. First, we found that over 7% of men and over 13% of women attributed requiring help injecting to not knowing how to inject properly. Since safer injecting education is a primary service of SIFs, this problem is amenable to immediate improvement through the provision of this service. Second, a high proportion of IDU attributed requiring help due to having no viable veins in their arms, and SIFs may help to educate IDU about how to preserve vein integrity to avoid this concern. In addition, there are also data to suggest that IDU who report not being able to inject in their arms, are commonly later able to do so after receiving safer injecting education and supervision.²⁶ This evidence comes from the Dr. Peter Centre, an adult day program for persons living with HIV, where the nursing staff have recently disclosed that they have begun supervising individual IDUs as they injected in the facility.^{27,28} What is particularly interesting about their experience is the observation that knowledge regarding the identification of useable veins is extremely low, and that IDU who were previously unable to find veins in their arms were later able to inject there after receiving safer injecting education regarding the proper use of a tourniquet.²⁶ Third, previous studies have found that IDUs report attending SIFs to avoid street predators and to inject in peace.^{18,20} Given that IDU reported requiring help injecting due to shaky hands and anxiousness, providing a safe space may help reduce this concern. Although we were

unable to assess reasons for 'jugging' among female IDU, SIFs could ensure that when assisted injections are performed, sterile injecting practices are implemented in every case.^{29,30}

This study has several limitations. Most importantly, as with most other cohort studies of IDU, the VIDUS study is not a random sample. In addition, the present study was restricted to a cross-sectional survey that relies on self-report of IDU and is hence susceptible to socially desirable reporting.^{31,32} It is also important to note that the independent predictors we found are not necessarily causal. For instance, borrowing a used syringe is less likely a cause of needing help injecting, than a result of it. On the other hand, the association with female gender has important public health implications.

Within the framework of current health approaches, such as needle exchange, addressing the concerns associated with requiring help injecting will be extremely difficult. However, given the wealth of evidence regarding this risk factor,^{10,13,14} and the strong evidence of the potential public health benefit of providing safer injecting facilities,^{10,18-22} it would be negligent for health policy-makers to delay initiating a pilot study.^{29,30,33}

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Received: November 6, 2002
Accepted: February 21, 2003

RÉSUMÉ

Contexte : On a récemment associé le fait d'avoir besoin d'aide pour se piquer au partage des seringues, et plus tard à la séroconversion VIH-1 et VHC chez les utilisateurs de drogues injectables (UDI) de Vancouver. Nous avons voulu étudier ce facteur de risque, encore mal compris, chez les UDI de Vancouver.

Méthode : À l'aide d'analyses univariées et de régression logistique, nous avons évalué les facteurs associés au fait d'avoir besoin d'aide pour se piquer chez les participants de la VIDUS (enquête vancouveroise auprès des utilisateurs de drogues injectables). Les analyses portaient sur les participants à la VIDUS ayant fait l'objet d'un suivi entre décembre 2000 et décembre 2001. Nous avons également évalué les motifs pour lesquels les intéressés déclaraient avoir besoin d'aide pour se piquer.

Résultats : Dans l'ensemble, 661 utilisateurs actifs de drogues injectables ont été interviewés durant la période de référence. De ce nombre, 151 (22,8 %) avaient eu besoin d'aide pour se piquer au cours des six mois précédents, et 510 (77,2 %) n'en avaient pas eu besoin. Certaines variables présentaient une corrélation indépendante avec le fait d'avoir besoin d'aide pour se piquer : l'emprunt d'une seringue usagée (rapport de cotes ajusté [RCA] = 2,18), l'injection fréquente de cocaïne (RCA=1,57) et le fait d'être une femme (RCA=2,29). Chez les hommes, les raisons le plus souvent déclarées d'avoir besoin d'aide pour se piquer étaient l'absence de veines adéquates (77,1 %) et l'anxiété ou l'état de manque (42,9 %). Chez les femmes, les raisons le plus souvent déclarées étaient l'absence de veines adéquates (71,6 %), l'injection dans une veine jugulaire (45,7 %) et l'anxiété ou l'état de manque (27,2 %). Les femmes étaient près de deux fois plus nombreuses que les hommes (13,6 % contre 7,1 %) à déclarer avoir besoin d'aide parce qu'elles ne savaient pas comment s'y prendre.

Conclusion : Bien que les approches actuelles de santé publique, comme l'échange de seringues, ne répondent pas aux préoccupations liées au fait d'avoir besoin d'aide pour se piquer, les données disponibles donnent à penser que des piqueries plus sûres pourraient peut-être atténuer considérablement ce comportement à risque.