

Factors Associated with Syringe Sharing Among Users of a Medically Supervised Safer Injecting Facility

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Abstract: Vancouver, Canada recently opened a medically supervised safer injecting facility (SIF) in an effort to reduce HIV and overdose risk and public injection drug use. We sought to examine factors associated with syringe sharing among SIF users. SIF users were randomly recruited into a prospective cohort of SIF users known as the Scientific Evaluation of Supervised Injecting (SEOSI) cohort. We examined the prevalence and correlates of used syringe borrowing among baseline HIV-negative participants and used syringe lending among baseline HIV-infected participants. Between 22 March 2004 and 22 October 2004, 479 baseline HIV-negative subjects (48 [10%] syringe borrowing events) and 103 baseline HIV-infected participants (17 [16.5%] syringe lending events) were recruited into the cohort. For baseline HIV negative participants, syringe borrowing was positively associated with public drug use ($p < 0.001$) and requiring help injecting ($p = 0.001$), whereas exclusive SIF use was inversely associated with syringe sharing ($p = 0.019$). For baseline HIV-infected participants, syringe lending was positively associated with daily cocaine injection ($p = 0.022$) and shooting gallery use ($p = 0.007$). Although ongoing injection-related HIV risk behavior was reported among some SIF users, rates of syringe sharing were substantially lower than the rate observed previously in this community and it is noteworthy that exclusive SIF use was associated with reduced syringe sharing.

Key words: SEOSI, safer injecting facility, reduced syringe sharing, risk factors for syringe sharing

INTRODUCTION

Injection drug use continues to be a primary driver of the HIV epidemic in many areas around the globe^[1]. While there is strong evidence to suggest that substantial sexual transmission of HIV occurs^[2,3], it has been demonstrated that syringe sharing is a primary driver of HIV transmission within this population^[4,5]. Accordingly, efforts to reduce syringe sharing among injection drug users (IDUs) have received significant attention and efforts to increase the provision of sterile syringes through needle exchange programs and other means have been adopted^[6,7]. More recently, medically supervised safer injecting facilities (SIF) have been implemented in an effort to reduce public drug use, HIV risk behaviour and overdose deaths^[8,9].

We have recently examined factors associated with syringe sharing among a community recruited sample of IDUs in a setting where a SIF has recently been opened^[10]. In this study, we demonstrated that SIF use was associated with reduced syringe sharing. However, this study only demonstrated that SIF use was associated with reduced syringe sharing and little is known about what leads to syringe sharing among users of SIF. The present study was therefore conducted to

examine the prevalence and correlates of syringe sharing among users of North America's first government sanctioned SIF which opened in Vancouver, Canada on September 22, 2003.

MATERIALS AND METHODS

The Vancouver SIF, known as Insite, is centrally located in Vancouver's Downtown Eastside, which is the most impoverished urban neighborhood in Canada and home to well documented infectious disease epidemics among the estimated 5,000 IDUs that reside there^[11]. The SIF is being evaluated through the Scientific Evaluation of Supervised Injecting (SEOSI) cohort, which has been described in detail previously^[12]. Briefly, the SEOSI cohort is based on a representative sample of Insite users. This sample was derived through random recruitment of SIF users who provide informed consent to enroll into the study. Random recruitment involves using random number generation to select blocks of time during the hours that Insite is open (between 10:00am and 4:00am). During these times, users of the SIF are invited to enroll in the SEOSI study and a nominal financial incentive (\$20 CDN) is offered to those who attend the research site,

located one block away from Insite. Among individuals who wish to enroll in the SIF evaluation and provide informed consent, a venous blood sample is drawn and an interviewer-administered questionnaire is conducted. The SEOSI cohort has been ethically approved by the University of British Columbia/Providence Healthcare Research Ethics Board.

The primary endpoints in the present study were borrowing a used syringe in the last six months among HIV-negative participants and lending a used syringe in the last six months among HIV-infected participants. Since we were primarily concerned with syringe sharing in the community that had occurred after the SIF was available and since the measure of syringe sharing was in reference to the prior six months, we only considered participants who were recruited during the period beginning six months after the SIF had opened (March 22nd, 2004) and at the end of the first follow-up period (October 22, 2004).

Variables considered in these analyses included: age, gender, difficulty accessing sterile syringes (yes vs

no), daily cocaine injection (yes vs no), daily heroin injection (yes vs no), public drug use (yes vs no), shooting gallery use (yes vs no), requiring help with injections (yes vs no), binge drug use (yes vs no), current Methadone Maintenance Therapy (MMT) use (yes vs no), sex-trade involvement (yes vs no), having been in jail overnight or longer (yes vs no), sexual abuse history (yes vs no) and exclusive use of the SIF for injection drug use during the month prior to the interview (yes vs no). Unless otherwise noted, all behavioral variables were in regard to the six months prior to the interview, with the exception of sexual abuse history which referred to ever in the past. Definitions of drug use behaviors were identical to previous reports^[13,14].

Variables potentially associated with syringe lending and borrowing were examined in bivariate analyses using Pearson's Chi-square test and the Wilcoxon rank sum test. All statistical analyses were performed using SPSS 12.0. All p-values are two sided with a significance level of $p < 0.05$.

Table 1: Bivariate analyses of factors associated with syringe borrowing among HIV-negative participants

Characteristic	Borrowed n (%)	No Borrow n (%)	Odds Ratio (95% CI)	p value
Gender				
Male	32 (66.7)	310 (71.9)	0.78 (0.41 - 1.47)	0.444
Female	16 (33.3)	121 (28.1)		
Hard Getting Syringes				
Yes	9 (18.8)	58 (13.5)	1.48 (0.68 - 3.22)	0.316
No	39 (81.2)	373 (86.5)		
Daily Cocaine Injection				
Yes	10 (20.8)	103 (23.9)	0.84 (0.40 - 1.74)	0.635
No	38 (79.2)	328 (76.1)		
Daily Heroin Injection				
Yes	26 (54.2)	211 (49.0)	1.23 (0.68 - 2.24)	0.493
No	22 (45.8)	220 (51.0)		
Public Drug Use				
Yes	45 (93.8)	293 (68.0)	7.07 (2.16 - 23.13)	<0.001
No	3 (6.2)	138 (32.0)		
Shooting Gallery Use				
Yes	7 (14.6)	38 (8.8)	1.77 (0.74 - 4.21)	0.194
No	41 (85.4)	393 (91.2)		
Require Help injecting				
Yes	26 (54.2)	135 (31.3)	2.59 (1.42 - 4.74)	0.001
No	22 (45.8)	296 (68.7)		
Binge Drug Use				
Yes	28 (58.3)	255 (59.2)	0.97 (0.53 - 1.77)	0.912
No	20 (41.7)	176 (40.8)		
On Methadone				
Yes	11 (22.9)	90 (20.9)	1.13 (0.55 - 2.30)	0.743
No	37 (77.1)	341 (79.1)		
Sex-trade Involvement				
Yes	12 (25.0)	89 (20.6)	1.28 (0.64 - 2.56)	0.483
No	36 (75.0)	342 (79.4)		
Recently Incarcerated				
Yes	3 (6.3)	16 (3.7)	1.73 (0.49 - 6.16)	0.424
No	45 (93.8)	415 (96.3)		
Sex abuse History				
Yes	19 (39.6)	125 (29.0)	1.60 (0.87 - 2.97)	0.129
No	29 (60.4)	306 (71.0)		
Exclusive SIF Use				
Yes	0 (0.0)	42 (9.7)	0.14 (0.00 - 0.78)	0.019
No	48 (100.0)	389 (90.3)		

Note: C.I. = Confidence Interval; All behaviours refer to the prior six months with the exception of methadone, which refers to current use and sex abuse history which refers to any time in the past

RESULTS AND DISCUSSION

Between 22 March 2004 and 22 October 2004, 594 individuals were recruited into the SEOSI cohort among whom 479 (80.6%) were baseline HIV-negative and 103 (17.3%) were baseline HIV-infected. Twelve (0.02%) individuals were excluded because HIV serology was unavailable at the time of this analysis. There were no statistical differences in age, gender, ethnic background, daily cocaine use and daily heroin use between the 303 individuals who were recruited during the first six months after the SIF opened and the 582 individuals who eligible for the present study (all $p > 0.05$). Overall, among the 479 baseline HIV-negative individuals, 48 (10%) reported borrowing a used syringe in the prior six months. As shown in Table 1, syringe borrowing among HIV-negative subjects was positively associated with public drug use (Odds Ratio [OR] 7.07, [95% Confidence Interval [CI]: 2.16 - 23.13]; $p < 0.001$) and requiring help injecting (OR 2.59, [95% CI: 1.42 - 4.74]; $p = 0.001$). Conversely, syringe borrowing was inversely associated with

performing all injections in the last month within the SIF (OR 0.14, [95% CI: 0.00- 0.78]; $p = 0.019$).

Overall, among the 103 baseline HIV-positive individuals who were eligible for the present study, 17 (16.5%) reported lending a used syringe in the prior six months. As shown in Table 2, syringe lending was associated with daily cocaine injection (OR 3.42, [95% CI: 1.15 - 10.2]; $p = 0.022$) and shooting gallery use (OR 6.16, [95% CI: 1.75 - 21.70]; $p = 0.007$). Both public drug use (OR 6.19, [95% CI: 0.78 - 49.30]; $p = 0.065$) and binge drug use (OR 3.36, [95% CI: 0.90 - 12.56]; $p = 0.060$) were marginally associated with syringe lending.

The present study indicates that a minority of SIF users continue to share syringes outside of the SIF. Factors positively associated with used syringe borrowing included public injection drug use and requiring help injecting, whereas exclusive SIF use in the month prior to the baseline interview was associated with lower syringe sharing. Among baseline HIV-infected participants, syringe lending was associated with cocaine injection and shooting gallery use.

Table 2: Bivariate analyses of factors associated with syringe lending among HIV-positive participants

Characteristic	Borrowed n (%)	No Borrow n (%)	Odds Ratio (95% CI)	p value
Gender				
Male	9 (52.9)	57 (66.3)	0.57 (0.20 - 1.64)	0.295
Female	8 (47.1)	29 (33.7)		
Hard Getting Syringes				
Yes	2 (11.8)	8 (9.3)	1.30 (0.25 - 6.74)	0.669
No	15 (88.2)	78 (90.7)		
Daily Cocaine Injection				
Yes	11 (64.7)	30 (34.9)	3.42 (1.15 - 10.2)	0.022
No	6 (35.3)	56 (65.1)		
Daily Heroin Injection				
Yes	10 (58.8)	38 (44.2)	1.81 (0.63 - 5.19)	0.269
No	7 (41.2)	48 (55.8)		
Public Drug Use				
Yes	16 (94.1)	62 (72.1)	6.19 (0.78 - 49.30)	0.065
No	1 (5.9)	24 (27.9)		
Shooting Gallery Use				
Yes	6 (35.3)	7 (8.1)	6.16 (1.75 - 21.70)	0.007
No	11 (64.7)	79 (91.9)		
Require Help injecting				
Yes	8 (47.1)	29 (33.7)	1.75 (0.61 - 5.00)	0.295
No	9 (52.9)	57 (66.3)		
Binge Drug Use				
Yes	14 (82.4)	50 (58.1)	3.36 (0.90 - 12.56)	0.060
No	3 (17.6)	36 (41.9)		
On Methadone				
Yes	5 (29.4)	29 (33.7)	0.82 (0.26 - 2.55)	0.730
No	12 (70.6)	57 (66.3)		
Sex-trade Involvement				
Yes	6 (35.3)	17 (19.8)	2.21 (0.72 - 6.84)	0.202
No	11 (64.7)	69 (80.2)		
Recently Incarcerated				
Yes	1 (5.9)	4 (4.7)	1.28 (0.13 - 12.23)	0.999
No	16 (94.1)	82 (95.3)		
Sex abuse History				
Yes	10 (58.8)	34 (39.5)	2.19 (0.76 - 6.30)	0.142
No	7 (41.2)	52 (60.5)		
Exclusive SIF Use				
Yes	0 (0.0)	4 (4.7)	0.94 (0.00 - 7.90)	0.961
No	17 (100.0)	82 (95.3)		

Note: C.I. = Confidence Interval; All behaviours refer to the prior six months with the exception of methadone, which refers to current use and sex abuse history which refers to any time in the past

Among IDUs in this setting, we have previously reported semi-annual syringe lending and borrowing rates that are significantly higher than those observed among the SIF users considered in the present study^[5, 15]. Lower rates of syringe sharing among SIF users is consistent with a recent report^[10] and is likely due to the reduced risks associated with injecting in a hygienic environment where sterile syringes are provided. The fact that no instances of syringe lending or borrowing were observed among individuals who reported performing all injections within the SIF is encouraging, although it is noteworthy that the SIF can only accommodate 12 injectors at any given time and the capacity is such that the SIF can only service a fraction of the injections occurring in the community. With regard to the risk factors for syringe lending and borrowing identified in the present study, the fact that requiring help with injections was associated with syringe borrowing is not surprising given that it has been shown to be among the strongest determinants of syringe sharing and HIV-infection in this community in several earlier analyses^[10,13,14]. This finding also has immediate relevance of SIF operation since these participants may benefit from safer injecting education and since assisted injection is not presently allowed within the SIF^[12, 16]. It is also interesting that public drug use and shooting gallery use were associated with syringe sharing among SIF users, given that homeless and public drug users may be more likely to use the SIF^[17]. This association will have to be explored further in future studies, since reducing wait times at the SIF, extending operating hours and performing outreach into shooting galleries may all be helpful in addressing this concern.

The present study has limitations. First, previous studies have demonstrated that socially stigmatized behaviours, such as syringe sharing, may be under-reported by IDUs^[18]. While it is likely that rates of syringe sharing were under-estimated in the present study, we know of no reason why drug use characteristics or other risk factors would be differentially reported by IDUs that exhibited the risk factors we identified, such as public drug use or requiring help injecting. Finally, it is arguable that ethnographic inquiry and qualitative analyses may have the potential to help determine why specific risk factors, such as public injection drug use and shooting gallery use, were associated with elevated rates of syringe sharing in this environment.

CONCLUSION

In conclusion, we found that syringe sharing remains prevalent among a minority of SIF users, although rates of syringe sharing among this population are substantially lower than the rate observed previously in this community and it is noteworthy that

exclusive SIF use was associated with reduced syringe sharing. This finding is particularly significant because it confirms earlier findings through an independent data source^[10]. Further study is required to examine whether the risk factors for syringe sharing identified in the present study will be amenable to further reduction through modification of potential barriers to SIF use, such as modifying SIF operating hours and regulations that prohibit assisted injection within the SIF.

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