

Safer injection facility use and syringe sharing in injection drug users

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Safer injection facilities provide medical supervision for illicit drug injections. We aimed to examine factors associated with syringe sharing in a community-recruited cohort of illicit injection drug users in a setting where such a facility had recently opened. Between Dec 1, 2003, and June 1, 2004, of 431 active injection drug users 49 (11.4%, 95% CI 8.5–14.3) reported syringe sharing in the past 6 months. In logistic regression analyses, use of the facility was independently associated with reduced syringe sharing (adjusted odds ratio 0.30, 0.11–0.82, $p=0.02$) after adjustment for relevant sociodemographic and drug-use characteristics. These findings could help inform discussions about the merits of such facilities.

Vancouver, Canada, like many urban centres, has been the site of continuing HIV and overdose epidemics in illicit injection drug users.¹ In response to these public health problems, health officials in Vancouver opened North America's first medically supervised safer injection facility in September, 2003.^{1,2} As previously described,¹ injection drug users in the facility can access sterile injecting equipment, inject preobtained illicit drugs under the supervision of nurses, and access nursing care and addictions counselling. Although such facilities exist in several European settings and in Sydney, Australia, few formal epidemiological analyses have been done of their effects on reported HIV risk behaviours, such as syringe sharing.^{1,3,4} In Vancouver, a continuing prospective cohort study of injection drug users allowed us to examine factors associated with syringe sharing in local users after the opening of the safer injection facility.

We obtained data for these analyses from the Vancouver Injection Drug Users Study,⁵ a prospective cohort that has been described previously. The study has been approved by the University of British Columbia and Providence Health Care ethics review boards, and all study participants provided written consent before enrolment. To be consistent with earlier analyses,⁶ and to provide sufficient statistical power, syringe sharing was defined as borrowing or lending a used syringe in the past 6 months. Data from participants seen between Dec 1, 2003, and June 1, 2004, were assessed in our study. We used univariate and multivariate statistics to determine factors associated with syringe sharing in the past 6 months. The associations between independent variables and the dependent variable were first analysed by univariate logistic regression. To adjust for potential confounding between use of the safer injection facility and syringe sharing, variables that were found to be significantly associated with syringe sharing ($p<0.05$) were then considered in a fixed logistic regression model, which included all variables that met this criteria as well as the facility use variable. We did all statistical analyses using SAS software version 8.0 (SAS, Cary, NC, USA).

We selected sociodemographic and drug use characteristics in these analyses on the basis of previous investigations of syringe sharing in injection drug users

in Vancouver,^{6,7} including: age, HIV serostatus, limited access to sterile syringes, need for help with injections, binge drug use, frequency of cocaine and heroin injection, and methadone maintenance treatment. Variable definitions were consistent with previous analyses: individuals who reported using cocaine or heroin once a day or more were defined as frequent cocaine or heroin users.⁶ Bingeing was defined as periods in which drugs were used more often than usual.⁶ To evaluate the effect of needle exchange programme access on syringe sharing, we compared participants who did and did not report accessing sterile syringes from such a programme. To consider the effect of the safer injection facility, we compared participants who reported undertaking all, most, or some of their injections at the facility with those participants who reported undertaking few or none of their injections at the facility.

431 active injection drug users were seen for follow-up during the study period, of whom 90 (20.9%, 95% CI 17.1–24.7) reported that all, most, or some of their injections were at the safer injection facility. 49 (11.4%, 8.5–14.3) individuals reported sharing syringes during this same period. Univariate analyses showed that need for help with injecting (odds ratio [OR] 2.94, 95% CI 1.59–5.42, $p=0.01$), bingeing (OR 2.04, 1.05–3.95, $p=0.03$), frequent heroin (OR 1.72, 0.95–3.13, $p=0.07$) or cocaine injection (OR 1.70, 0.93–3.06, $p=0.08$) were positively associated with syringe sharing, whereas younger age (OR 0.95 per year, 0.92–0.99, $p=0.01$) and use of the safer injection facility (OR 0.39, 0.15–1.03, $p=0.05$) were negatively associated with syringe sharing. In a logistic regression model, need for help injecting and binge drug use were positively associated with syringe sharing, whereas younger age and use of the facility were independently associated with reduced syringe sharing (table).

The protective effect of safer injection facility use remained independently associated with reduced syringe sharing when we further adjusted the model to include frequent heroin and cocaine injection (adjusted OR 0.29, 0.11–0.78, $p=0.01$). Although our logistic models included a small number of syringe sharing



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	Adjusted odds ratio (95% CI)	p
Age (per year older)	0.95 (0.92–0.98)	0.01
Use of safer injection facility	0.30 (0.11–0.82)	0.02
Need for help injecting	2.95 (1.57–5.55)	0.01
Binge drug use	2.04 (1.02–4.08)	0.04
Intercept (constant)	(–0.79)	0.19

Model adjusted for all variables shown.

Table: Multivariate logistic regression of factors associated with syringe sharing

events, a goodness of fit test indicated that the estimated models fit the data.

We realised that despite multivariate adjustment, our findings could be due to residual confounding if the safer injection facility had selected injection drug users who were inherently at a lower risk of syringe sharing. To test for this, we examined the rate of syringe sharing for those who did use the facility and those who did not during their follow-up visit immediately before its opening on Sept 22, 2003. Rates of syringe sharing were similar in these populations before the opening (χ^2 0.46, 1 degree of freedom, $p=0.50$), and the differences only emerged during follow-up after the facility had opened.

We have shown that use of a medically supervised safer injection facility was independently associated with reduced syringe sharing in a community-recruited sample of injection drug users who had similar rates of syringe sharing before the facility's opening. Our study has several limitations. First, although previous studies have indicated that the Vancouver Injection Drug Users Study cohort is representative of local users,⁶ it is not a random sample. Second, although it is highly plausible that provision of sterile injecting equipment and medical supervision of injection drug use could be causally related with reduced syringe sharing, our study is limited by its cross-sectional design and hence we caution against inferring such a causal relation. However, our prospective approach showed that differences in the rate of syringe sharing only emerged after the facility opened. It is noteworthy that ethical issues will probably prevent interventional study designs that could completely resolve the issues of selection effects and unmeasured confounding. It should also be noted that we probably underestimated rates of syringe sharing and borrowing because of socially desirable responding, and we were forced to use a combined

endpoint of lending and borrowing to obtain adequate statistical power. We have justified this approach previously, and we applied a rigorous approach in our attempts to control for potential confounders.⁶ Future prospective analyses with nominal data about recent use of safer injection facilities are needed to further elucidate the relation between their use and syringe sharing. Our findings could help to inform discussions in the UK and elsewhere, where the potential public-health benefits of such facilities are of growing interest.^{1,8}

Contributors

T Kerr and E Wood designed the study. K Li and T Kerr did statistical analyses. T Kerr drafted the report and incorporated all suggestions. J Montaner and M Tyndall contributed to conception and design of the analyses, interpretation of data, and drafting of the report, and all authors approved the version to be published.

Conflict of interest statement

We declare that we have no conflict of interest.

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