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Research paper

Increasing awareness about HIV prevention among young people who initiated injection drug use in a Canadian setting, 1988–2014

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ABSTRACT

Background: Globally, harm reduction interventions, including needle and syringe programs (NSPs), have been shown to reduce HIV risks among people who inject drugs (PWID). However, little is known about the impact of these efforts on the circumstances of first injection. Therefore, we sought to identify changes in the awareness about HIV prevention and syringe borrowing at the time of first injection drug use in Vancouver, Canada, during a period of NSP expansion.

Methods: Data were drawn from prospective cohorts of PWID in Vancouver, who initiated injecting between 1988 and 2014. Multivariable regression was used to assess changes in the awareness about HIV and NSPs and syringe borrowing behaviour at first injection against calendar year of first injection.

Results: Among 1044 participants (36.9% female), at the time of first injection 73.9% reported having known syringe sharing was an HIV risk, 54.1% reported having heard of NSPs, and 7.8% reported having borrowed a syringe used by others. In multivariable analyses, calendar year of first injection was independently and positively associated with awareness about HIV (adjusted prevalence ratio [APR]: 1.09; 95% confidence interval [CI]: 1.06, 1.11) and awareness about NSPs (APR: 1.18; 95% CI: 1.13, 1.24). While calendar year of first injection was significantly and negatively associated with syringe borrowing at first injection in bivariable analyses, the association did not remain significant in multivariable analyses (adjusted odds ratio: 0.90; 95% CI: 0.72, 1.14).

Conclusions: We found that awareness about HIV and NSPs at first injection have increased over time amongst PWID in this setting. However, declining trends in syringe borrowing at first injection were not determined after adjustment for socio-demographic characteristics. This suggests that HIV prevention efforts may have contributed to increased awareness about HIV prevention, but further research is needed to identify sub-populations at heightened risk of HIV at first injection.

Introduction

Injection drug use represents increased vulnerability to the human immunodeficiency virus (HIV) and remains a critical global issue. In 2013, there were an estimated 35 million people living with HIV globally. Outside of sub-Saharan Africa, 30% of new HIV infections were occurring amongst people who inject drugs (PWID), notably through the sharing of contaminated injection equipment (Joint United Nations Programme on HIV/AIDS, 2014b). It is also estimated that worldwide there are nearly 12.7 million PWID with roughly 1.7 million or 13% living with HIV (United Nations Office on Drugs and Crime, 2014). The prevalence of HIV amongst PWID remains almost 28 times as high as that in the general population (Joint United Nations Programme on HIV/AIDS, 2014a). Because HIV transmission through contaminated injection equipment is highly efficient, HIV can be rapidly spread in networks of PWID once introduced. For example, in the Middle East and Northern Africa, where HIV epidemics have primarily

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been driven by unprotected sexual behaviour, recent reviews have shown that injection drug use has recently emerged as a major driver of the epidemics (Joint United Nations Programme on HIV/AIDS, 2014b; Mumtaz, Riedner, & Abu-Raddad, 2014). Thus, PWID continue to represent a key population for the global HIV/AIDS response.

Fortunately, over the past two decades, a number of evidence-based public health interventions have been developed in response to HIV transmission amongst PWID. These include needle and syringe programmes (NSPs) (Wodak & Cooney, 2006; World Health Organization, 2004b; World Health Organization, United Nations Office for Drug Control, Joint United Nations Programme on HIV/AIDS, 2004), opioid agonist therapies (Mattick, Breen, Kimber, & Davoli, 2009; World Health Organization, 2004a), and targeted education (Aggleton, Jenkins, & Malcolm, 2005; Ball, Beg, Doupe, & Weiler, 2005; Harm Reduction International, 2014); they have been endorsed by the United Nations agencies as key interventions to prevent HIV infection amongst PWID (United Nations Office on Drugs and Crime, Joint United Nations Programme on HIV/AIDS, 2012).

While a substantial amount of research has been done on the favourable impact of these public health interventions on HIV incidence amongst established PWID (Bastos & Strathdee, 2000; Des Jarlais et al., 2000; Des Jarlais, 2000a, 2000b; Monterroso et al., 2000; Vlahov, Robertson, & Strathdee, 2010), little is known about the effect of these interventions on young people who are initiating injection drug. This is a growing concern as a recent estimate of prevalence of HIV amongst young PWID under 25 years old was as high as 5.2% (Joint United Nations Programme on HIV/AIDS, 2014a). This indicates that there is a need to understand the awareness of young PWID regarding HIV risk behaviour and prevention at the onset of injection drug use.

Vancouver, Canada, experienced an explosive HIV outbreak amongst PWID in the mid-1990s, particularly in the city's Downtown Eastside neighbourhood, which houses close to one third of the PWID in Vancouver (Hyshka, Strathdee, Wood, & Kerr, 2012). This outbreak was characterized by some of North America's highest HIV incidence rates, despite the presence of public health efforts to prevent HIV implemented in this setting, including NSPs that were initiated in 1988 (Hyshka et al., 2012; Strathdee, Patrick, Currie, et al., 1997). Accordingly, many questioned how this HIV outbreak could have occurred in the years following the initiation of NSPs (Wood et al., 2003, 2009). After extensive research, it became clear that Vancouver's PWID had a lot of difficulty in accessing sterile drug paraphernalia because of restrictive syringe exchange policies as well as programmatic barriers, such as limited NSP facilities and hours of operation (Hyshka et al., 2012; Strathdee, Patrick, Currie, et al., 1997). Thus, even though NSPs were in place, they were not being optimally used by PWID. Fortunately, improvements were made to the NSPs in the early 2000s (Hyshka et al., 2012), which have led to declining rates of syringe sharing amongst PWID (Kerr et al., 2010). The existence of public health interventions that have been shown to reduce HIV risks among established PWID (Bastos & Strathdee, 2000; Monterroso et al., 2000; Wood et al., 2009) and the presence of large long-running prospective cohort studies of PWID beginning in 1996 in Vancouver make it an ideal setting to examine trends of awareness about HIV prevention and HIV risk behaviour amongst people who initiate injection drug use over a period of more than two decades. Our hypothesis for the present study was that PWID's awareness about HIV and NSPs at the time of first injection have risen with time, while rates of syringe borrowing (*i.e.*, receptive syringe sharing) have decreased with time presumably because of the improvements in public health policy and NSPs in this setting.

Methods

Study design

Data for this analysis were derived from the assessments of a series of ongoing open prospective cohort studies involving people who use drugs, including the At-Risk Youth Study (ARYS), the AIDS Care Cohort to evaluate Exposure to Survival Services (ACCESS), and the Vancouver Injection Drug Users Study (VIDUS). The VIDUS study began enrolment in May 1996 and recruits individuals who injected drugs in the month prior to enrolment through word of mouth, street out-reach, and referrals. In 2005, the original VIDUS cohort was divided into two separate studies: VIDUS now follows HIV-negative PWID and ACCESS follows HIV-positive drug users residing in the Greater Vancouver area. The ARYS began in late 2005 and is made up of street-involved youth who report use of drugs other than or in addition to cannabis and are aged 14–26 (Wood, Stoltz, Montaner, & Kerr, 2006).

Sampling and follow-up methodologies for the three cohort studies have been described in detail previously (Nosyk et al., 2012; Strathdee, Patrick, Archibald, et al., 1997; Wood et al., 2009; Wood, Stoltz, Li, Montaner, & Kerr, 2006). Specific eligibility criteria were outlined in other articles; however, general eligibility across all three cohorts required age of at least 14 years, residence in the Greater Vancouver region, and the provision of informed consent. At baseline and semi-annually thereafter, participants complete an interviewer-administered questionnaire that elicits information pertaining to sociodemographic characteristics, drug use, treatment utilization, and HIV risk behaviours. Nurses obtain blood specimens for HIV and Hepatitis C Virus (HCV) serology, and HIV disease monitoring (*e.g.*, CD4 counts, HIV-1 RNA) where appropriate. Participants receive $30 CAD for each visit. All studies utilize harmonized recruitment and data collection tools, enabling us to combine data from studies with different inclusion criteria. The University of British Columbia and Providence Health Care Research Ethics Boards have approved these studies.

Study participants and measures

For the present analysis, all cohort participants who were enrolled in any of the three cohorts (ARYS, ACCESS, and VIDUS) between June 1, 2006 and May 31, 2014 were considered for inclusion. Eligibility criteria included: (1) all cohort participants who reported a history of injection drug use at study enrolment and who initiated injection drug use on or after 1988; or (2) ARYS participants who were injection-naïve at baseline and who initiated injecting during follow-up. The year of 1988 was selected as the beginning of the study period as a large NSP begun to operate in Vancouver in 1988 (Hyshka et al., 2012).

The present analysis had three main outcomes: (1) awareness about HIV at the time of first injection, defined by answering "yes" or "no" to a question: "When you shot up for the first time, did you know a person could get HIV-infected by sharing needles?"; (2) awareness about NSPs at the time of first injection, defined by answering "yes" or "no" to a question: "Before you first injected, had you ever heard of needle distribution, where people can get needles for free?"; and (3) syringe borrowing at the time of first injection, defined by answering "yes" or "no" to a question: "The first time you fixed, did you use a needle that someone else had used?" While the first two outcomes were significantly correlated ($p < 0.001$), we considered them as two separate outcomes given that they were conceptually different, as well as because 258 of 1044 (24.7%) participants reported awareness about one but not the other.

Explanatory variables that were hypothesized to be associated with each of the three outcomes included: calendar year intervals