

Prevalence and temporal trends of crack injection among injection drug users in eastern central Canada

Élise Roy^{a,b,c,*}, Pascale Leclerc^b, Carole Morissette^{b,d}, Nelson Arruda^e, Caty Blanchette^f,
Karine Blouin^c, Michel Alary^{c,f,g}

^a Faculté de Médecine et des Sciences de la Santé, Université de Sherbrooke, Chaire de recherche en Toxicomanie, Longueuil, Québec, J4K 0A8, Canada

^b Agence de la Santé et des Services Sociaux de Montréal, Direction de Santé Publique, Montréal, Québec, H2L 1M3, Canada

^c Institut National de Santé Publique, Montréal, Québec, G1V 5B3, Canada

^d Département de médecine sociale et préventive, Université de Montréal, Montréal, Québec, H3N 1X7, Canada

^e Independent investigator and consultant

^f Unité de recherche en santé des populations, Centre de recherche, Hôpital du St-Sacrement du CHA, Québec, Québec, G1S 4L8, Canada

^g Département de médecine sociale et préventive, Université Laval, Québec, G1V 0A6, Canada

* Corresponding author at: Faculté de Médecine et des Sciences de la Santé, Université de Sherbrooke, Chaire de recherche en Toxicomanie, 150, Place Charles-Le Moyne, Bureau 200, Longueuil, J4K 0A8, Québec, Canada. Tel.: +1 450 463-1835, ext. 61823; fax: +1 450 463-6578. E-mail address: elise.roy@USherbrooke.ca

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Abstract

Background: Little is known about crack injection and its temporal trends in North America. This article describes the extent of crack injection and examines temporal trends among injection drug users (IDUs) recruited from 2003 to 2010 in the SurvUDI network.

Methods: IDUs who injected recently (past 6 months) were recruited in harm reduction and health programs in eastern central Canada. Trend analyses were performed using generalized estimating equations. Some IDUs participated multiple times; first interview was retained for the descriptive analyses, while first interview per year was retained for the trend analyses.

Results: Of the 4088 IDUs recruited, 15.2% (621) reported crack injection; large variations across sites were noted (range: 0.3%-39.5%). Trend analyses were limited to Ottawa (449 crack injectors) and Montréal (121). For Ottawa, a significant decline was observed, from 48.3% to 36.9%, with a prevalence ratio (PR) of 0.97 per year (95%CI: 0.94-0.99). For Montréal, a significant rise was observed, from 6.0% to 18.4%, with a PR of 1.29 per year (95%CI: 1.19-1.40).

Conclusions: Strong variations in crack injection exist throughout the SurvUDI network, and reversed temporal trends have been observed in Ottawa and Montréal. These data

will be useful to local harm reduction programs to evaluate the need to distribute items required by crack injectors and to develop prevention messages.

Keywords: Injection drug use; crack-cocaine; crack injection; temporal trends

1. Introduction

Over the past 30 years, crack use has grown significantly in North America. Crack first came onto the market in the United States in the 1980s (Inciardi, 1987; Bourgois, 1995; Jonnes, 1996; Agar, 2003) before being introduced into Canada in the 1990s, mostly among street-based opiate users and injection drug users (IDUs) (Millson et al., 1995; Millson et al., 1998; Public Health Agency of Canada, 2006; Fischer et al., 2007; Werb et al., 2010). Although crack is first and foremost a smokeable drug, several ethnographic accounts of crack being injected have been reported since the mid-90s (Johnson and Ouellet, 1996; Bourgois, Lettiere and Quesada, 1997; Carlson, Falck and Siegal, 2000; Sterk and Elifson, 2000; Clatts et al., 2002; Lankenau et al., 2004). Unlike powder cocaine, crack is not soluble in water; therefore users who want to inject the drug use acids such as lemon juice or vinegar to dissolve it (Bourgois, Lettiere and Quesada, 1997; Carlson, Falck and Siegal, 2000; Clatts et al., 2002; Lankenau et al., 2004;).

Only a few studies have looked at the prevalence of crack injection among drug users. In the United Kingdom, up to 40% of IDUs recruited in several regions of England and Wales reported having injected crack in the few weeks before interview (Hunter et al., 1995, Rhodes et al., 2006; Hope et al., 2008). In the United States, lifetime prevalence of crack injection in a multisite study of young IDUs was estimated to be 15% and it was 9.4% for the 6-month period preceding interview (Santibanez et al., 2005). Secondary analyses of a targeted sample of IDUs recruited in three cities of New England, USA, (Hartford, New Haven and Springfield) showed that 9% had ever injected crack and 4.2% had done so in the previous 30 days (Buchanan et al., 2006).

Crack injection is of much public health concern notably given the increased risks of serious infections such as HCV and HIV infections. Some studies suggest that crack injectors are more likely than other IDUs to report risky drug-use behaviours, risky sexual behaviours or to have been exposed to hepatitis C virus infection (Santibanez et al., 2005; Buchanan et al., 2006). High rates of skin and soft tissue infections have also been reported among crack injectors (Buchanan et al., 2004; Hope et al., 2008). Furthermore, the preparation techniques involving use of acidifiers for dissolving crack have been shown to put users at risk for significant vein damage (Scott, 2008). The use of lemon juice to dissolve crack has also been reported as a possible risk factor for serious fungal infection (Albini et al., 2007), as it has for heroin (Newton-John et al. 1984; Servant et al., 1985). Public health authorities and harm reduction programs need to be informed of the evolution of crack injection to address the needs of street-based drug users in an optimal way.

While crack injection has been qualitatively documented for more than 15 years, studies on the prevalence of this practice remain scarce. Moreover, in a North American context where crack consumption is increasingly widespread, there is no data on temporal trends of injection use. For more than a decade, the SurvUDI network has been monitoring HIV/HCV prevalence, incidence and associated risk behaviours among IDUs in eastern central Canada. Using data from this surveillance database, we carried out analyses to estimate the prevalence of crack injection among these IDUs and to assess the annual trends of this practice.

2. Methods

The complete methodology of the SurvUDI study has been described elsewhere (Hankins et al., 2002). Briefly, SurvUDI is based on a second-generation surveillance program for HIV and HCV risk behaviours among IDUs in several regions of eastern central Canada. This ongoing network was implemented in 1995 and is based on a convenience sample of hard-to-reach, mostly out-of-treatment IDUs. Eligibility criteria include being aged 14 and older, injecting at least once within the past six months, speaking French or English, and being able to provide informed consent. The network covers nine Canadian health districts in the provinces of Québec and Ontario, including three urban areas (Montréal, Québec City and Ottawa) and six semi-urban/rural regions located in the province of Québec. Overall, 89.5% of participants were recruited in syringe distribution programs (SDPs). Others were recruited in settings such as drop-in centers, detention centers, detoxification clinics, and rehabilitation programs. Participation in SurvUDI includes completion of an interviewer-administered questionnaire and collection of saliva samples for HIV and HCV antibody testing. An encrypted unique identifier is created for each participant, allowing linkage of successive visits that must be at least six months apart. Participants receive a stipend at the end of each study visit (the amount has changed over time from CAN\$5.00 to \$10.00). All procedures have been approved by the ethics committee of the Centre Hospitalier Affilié Universitaire de Québec.

The main variable of interest for the present analyses was injection of crack in the six months prior to interview. Other variables considered in the descriptive analyses were age, sex, drug most often injected in the 6 months prior to interview and region of recruitment. All IDUs recruited in SurvUDI from 2003 to 2010 were included in the

analyses. Descriptive analyses based on variables collected at first visit included simple proportions and median calculations. Generalized estimating equations were employed to conduct annual trend analyses. For subjects with multiple visits in the same year, only the first visit was considered in any given year. Year of observation was treated as a continuous variable. Prevalence ratios were estimated using log-binomial regression and 95% Wald confidence intervals were calculated. All analyses were conducted using SAS version 9.3.

3. Results

In total, 4088 IDUs were recruited between 2003 and 2010. The median number of interviews completed by each of them during that period was 1 (range: 1-8). The majority of participants (81.2%) contributed only once to the trends analyses. At baseline, their median age was 36.0 years (interquartile range (IQR): 27.0–44.0 years) and 76.0% were males. A majority of participants (57.7%) most often injected powder cocaine, while 36.4% most often injected opioids (including 10.2% heroin and 26.2% prescription opioids). Overall, 15.2% (621) reported crack injection in the past six months; 71.2% of them were men and their median age was 35.0 years (IQR: 27.0–43.0 years). Prevalence of crack injection varied across sites, with higher proportions observed in the western regions: 0.3% (2) in Québec City, 1.3% (2) in Mauricie/Centre du Québec, 2.1% (3) in Abitibi/Témiscamingue, 5.6% (3) in Montérégie, 5.7% (14) in Estrie, 7.6% (121) in Montréal, 10.0% (6) in Saguenay, 21.0% (21) in Outaouais, and 39.5% (449) in Ottawa.

Annual trend analyses were limited to Ottawa and Montréal since only a few IDUs reported crack injection (≤ 21) in the other regions (Figure 1). For Ottawa, a significant decline of 3% per year was observed, with a prevalence ratio of 0.97 per year (95% CI: 0.94-0.99) and prevalence declining from 48.3% in 2003 to 36.9% in 2010. For Montréal, a significant rise of 29% per year was observed, with a prevalence ratio of 1.29 per year (95% CI: 1.19-1.40) and prevalence increasing from 6.0% in 2003 to 18.4% in 2010.

4. Discussion

Results of this study suggest that crack injection is relatively common among IDUs, mostly in Ottawa. They are also showing important regional variations. These results are analogous with previous studies showing prevalence differences across cities and regions. In England, the overall percentage of IDUs reporting crack injection in six cities was 40%; yet, in two cities, up to 70% of participants reported injecting crack (Rhodes et al., 2006). In the United States, site variations were also observed among young IDUs, with prevalence of recent crack cocaine injection as low as 1% in Harlem, New York and as high as 18.2% in New Orleans, Louisiana (Santibanez et al., 2005).

Explaining regional differences and reversed temporal trends between Montréal and Ottawa was beyond the scope of this study. However, previous studies provide hypotheses regarding factors that might influence the practice of crack injection. Several ethnographic studies have observed that crack injection generally emerges among established cocaine or speedball injectors who begin injecting crack as a substitute for powder cocaine in a drug market where crack becomes available at the expense of

powder cocaine (Johnson and Ouellet, 1996; Bourgois, Lettiere and Quesada, 1997; Carlson, Falck and Siegal, 2000; Clatts et al., 2002; Lankenau et al., 2004;). It is plausible that the regional variations and reversed trends observed in our study correspond to differences in local cocaine markets. The fact that powder cocaine has always been the drug most commonly injected by SurvUDI network participants (Roy et al., 2011) leads us to believe that crack acts as an alternative for powder cocaine injectors when powder cocaine is hard to find. This market hypothesis could also explain the opposite temporal trends between Montréal and Ottawa since market fluctuations may have occurred at different times during the study period. For Montréal, ethnographic studies conducted between 2000 and 2011 demonstrated that the crack street market started overtaking the powder cocaine street market in the 2000s (Bourgois and Bruneau, 2000; Roy et al., 2012). Powder cocaine sales strategies changed considerably during this period. Once easily accessible on the streets, powder cocaine has become available only via telephone order/delivery. This means that users who want to purchase powder cocaine must now have special personal contacts to procure it. They must also have a good sense of organisation to be able to show up for the meeting cash in hand, which is not always a given for street-involved people. This contrasts with crack, which is now accessible just about everywhere on downtown streets and is sold in small quantities at very low prices.

Other factors might have influenced the observed prevalence of crack injection. For example, the 4% annual decrease in Ottawa may be partly due to changes in public health policies. In the mid-2000s, Ottawa's City Council voted in favor of the distribution of safe crack-smoking kits. After much public debate, the "Safer Crack Use Initiative"

was implemented in Ottawa's needle exchange programs. In a study examining the impact of this initiative on HIV-HCV-related drug use practices, Leonard et al. reported a significant decline in recent injecting among needle exchange attendees (2008).

This study presents some limitations. One is the fact that the network is based on a convenience sample. Besides, previous studies have shown that IDUs attending harm reduction community-based resources are among the most at risk for HIV infection (Bruneau et al., 1997; Schechter et al., 1999; Bourgois and Bruneau, 2000). Therefore, our findings might reflect behaviours of IDUs attending these resources and not be generalizable to the whole IDU population. Furthermore, self-reported behavioural measures may lead to social desirability and recall biases that might have caused an underestimation of the proportion of participants reporting crack injection. However, previous studies have shown the validity and reliability of IDUs' self-reported behaviours (Goldstein et al., 1995; Darke, 1998). Whatever the direction and magnitude of these biases, they should not have had an impact on the observed trends since there were no major changes in recruitment strategies during the study period.

In conclusion, this study highlights the importance of epidemiologic surveillance of drug use behaviours at a regional level. Based on these data, local public health actions can be developed. For instance, in regions where crack injection is prevalent, distribution of acidifiers such as packets of citric acid or ascorbic acid might be envisioned to prevent infections and vein damage among users. Other strategies such as distribution of crack smoking equipment could also be implemented, along with coherent prevention messages, to facilitate transition towards a less harmful route of crack administration. In regions where crack injection prevalence is relatively low,

messages and actions aimed at preventing adoption of injection as a route of crack administration should be developed, including distribution of crack smoking equipment.

5. References

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6. Figure Legend

Figure 1:

Temporal trends of crack injection for Montréal and Ottawa (2003-2010).

