Drug use prior to incarceration and associated socio-behavioural factors among males in a provincial correctional facility in Ontario, Canada

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ABSTRACT

OBJECTIVES: To describe the prevalence of drug use in males in a provincial detention centre during the year before incarceration and to examine the association between socio-demographic and behavioural factors and drug use.

METHODS: In 2009, 500 adult males completed a survey after admission to a provincial detention centre in Ontario. Past-year prevalence rates were calculated for the use of opioids, cocaine, crack and methamphetamine, and by route of administration. Bivariate logistic regression was used to examine associations between drug use and socio-demographic and behavioural factors.

RESULTS: More than 56% of participants reported use of opioids, cocaine, crack or methamphetamine in the previous year. Risk factors for blood-borne and sexually transmitted infections were commonly reported for the previous year: 12.2% had injected drugs, 78.0% had had unprotected sex, and 48.0% had had more than one sexual partner. In unadjusted analyses, participants who were older than 24 years were more likely to have used any drugs and to have injected drugs in the previous year.

CONCLUSIONS: This study provides the first Canadian data in the past decade on drug use by recently incarcerated adults. We found that drug use and behaviours that increase the risk of transmission of sexually transmitted and blood-borne infections remain very common in this population. Incarceration provides an opportunity to provide services and links to programs for people who use drugs, which could decrease drug-related harms to individuals and society.

KEY WORDS: Prisons; drug use disorders; substance use disorders; street drugs

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

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International data reveal high rates of illicit drug use, misuse and dependence in incarcerated populations, and also of adverse sequelae of drug use such as blood-borne infections and death from overdose.[1-4]

In Canada, an estimated 150,000 people are incarcerated each year.[5] Few studies have examined drug use by people in provincial correctional facilities, where inmates are in remand or serving sentences of less than two years, or in federal correctional facilities, where inmates serve sentences of two years or longer.[6-14] Studies conducted between 1994 and 2007 have consistently identified high rates of overall drug use and of injection drug use. In provincial facilities in Quebec, 38% of 119 females and 26% of 492 males had injected drugs before incarceration in a 1994 study,[12] and 27.8% of 1,357 males and 42.8% of 250 females had ever injected drugs in a 2003 study.[14] In Ontario provincial facilities, 68% of 597 inmates had used any drugs, 51% had used drugs other than cannabis, and 17% had injected drugs in the year before incarceration in a 1996 to 1997 study;[9] 30.3% of 1,578 adult participants and 4.7% of 299 youth participants had ever injected drugs in a 2003 to 2004 study.[10] A 1998 survey of 355 male federal inmates in Ontario revealed that 37% (131/350) had ever injected drugs.[8] In a sample of 104 incarcerated women in British Columbia in 2001, 93% (n=97) reported having used illicit drugs and 65% having injected drugs.[13] A 2006 study of 417 youth aged 14 to 19 in provincial facilities in British Columbia showed very high rates of any non-injection drug use ever (98.3%), and 7.7% of participants (n=32) reported ever having injected drugs.[11] A 2007 national survey (N=3,370) of federal inmates found that 57% of men and 60% of women had used non-injection drugs, and 22% of men and 29% of women had injected drugs in their last six months in the community before incarceration.[6]

The high prevalence of drug use identified in these studies is of concern for at least two reasons. First, drug use is a significant cause of morbidity and mortality in and of itself.[15] Second, injection and some forms of non-injection drug use are associated with negative sequelae such as blood-borne and sexually transmitted infections[15,16] as a result of associated risk behaviours, such as unprotected sex, multiple sexual partners, and sharing of needles and other drug paraphernalia.[11,12,17] The high prevalence of these risk behaviours and of blood-borne and sexually transmitted infections in incarcerated populations in

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Table 1. Socio-demographic and behavioural characteristics of adult male inmates at a provincial correctional facility in Southern Ontario, 2009, N=500

Characteristic		n (%)
Age group	18-24	136 (27.2)
	25-34	160 (32.0)
	35-44	109 (21.8)
	>44	95 (19.0)
Marital status	Single	308 (61.6)
	Married	95 (19.0)
	Common law	36 (7.2)
	Separated	32 (6.4)
	Divorced	25 (5.0)
	Missing	4 (0.8)
STI* ever diagnosed	No	388 (77.8)
	Yes	111 (22.2)
	Missing	1 (0.2)
Hepatitis C ever diagnosed	No	433 (86.6)
	Yes	63 (12.6)
	Missing	4 (0.8)
Number of partners in past year	0	47 (9.4)
	1	207 (41.4)
	2-6	204 (40.8)
	>6	31 (6.2)
	Missing	11 (2.2)
Commercial sex involvement in past year	No	483 (96.6)
	Yes	14 (2.8)
	Missing	3 (0.6)
Sex while intoxicated in past year	No	138 (27.6)
	Yes	355 (71.0)
	Missing	7 (1.4)
Condom use in past year†	Never	254 (56.6)
	Occasionally	79 (17.6)
	Usually	54 (12.0)
	Always	62 (13.8)
Condom use at last sex†	No	349 (77.2)
	Yes	102 (22.6)
	Missing	1 (2.2)
Unprotected sex in the past year	No	109 (21.8)
	Yes	387 (77.4)
	Missing	4 (0.8)

* STI=sexually transmitted infection.
† Of n=452 who reported being sexually active in the past year.

Canada[6,8-14,18-24] suggests the need to include the incarcerated population in efforts to diminish problematic drug use, including harm reduction.

Monitoring of drug use patterns and behavioural risk factors in the incarcerated population can be used to inform secondary prevention efforts, such as screening on admission to correctional facilities and associated withdrawal management, linkage with resources during and after incarceration such as treatment and harm reduction programs, and primary prevention efforts in the community and in correctional facilities. The objectives of this study were to describe the prevalence of drug use before incarceration in this population and to examine the association between socio-demographic and behavioural factors and drug use.

METHODS

This study comprised a secondary data analysis of a study examining bacterial sexually transmitted infections in male inmates in a provincial detention centre in southern Ontario. The original study was conducted from June to December 2009. The methods are described in detail elsewhere[19] All newly admitted inmates were invited to participate, and those who were 18 or older and understood English well enough to consent were eligible to participate. The survey questionnaire was administered as a structured interview conducted by a study nurse.

A history of sexually transmitted infection was defined as a report of ever having had any of chlamydia, gonorrhea, syphilis, HIV/AIDS, genital herpes, genital warts, hepatitis B or *Trichomonas vaginalis* diagnosed, and a history of hepatitis C was defined as reporting ever having had hepatitis C diagnosed. Commercial sex involvement was defined as having given or taken money, drugs, shelter or food in exchange for sex. Sex while intoxicated was defined as having had sex while drunk or high. Regarding drug use, participants were asked whether in the past year they had used any of the following specific drugs without a physician's prescription for that drug: heroin, other opioids, cocaine, crack and crystal meth (methamphetamine); if they had, they were asked about route of administration. Unprotected sex was a derived variable and was defined as having been sexually active and not having always used a condom in the past year.

Table 2. Use of illicit substances* in the year prior to incarceration by adult male inmates at a provincial correctional facility in Southern Ontario, 2009, n=499

Substance	Use n (% of participants)	Injected drugs n (% of users)
Any	283 (56.6)	61 (21.6)
Heroin	37 (7.4)	22 (59.5)
Other opioids	176 (35.3)	52 (29.5)
Cocaine†	188 (37.8)	46 (24.5)
Crack	145 (29.1)	15 (10.3)
Methamphetamine	30 (6.0)	7 (23.3)

* Participants may have reported more than one drug used and more than one route of administration.
† 498 participants responded to this question.

Descriptive analyses included calculation of the prevalence of socio-demographic and sexual risk factors, and drug use data. The overlap in certain risk factors for blood-borne and sexually transmitted infections was specifically examined. Unadjusted logistic regression analyses examined the association between socio-demographic and behavioural factors and each of any drug use and injection drug use.

Approval for this study was obtained from the University of Toronto Research Ethics Board.

RESULTS

Of the 921 inmates who were eligible to participate and who were contacted by the study nurse, 500 participated, for a response rate of 54.3%. The age distribution of the sample was not significantly different from that of the admitted population during the study period.

Table 1 shows the distribution of socio-demographic and behavioural characteristics of study participants. More than half of the population were younger than 35, and the majority of participants were single. More than one fifth reported having ever received a diagnosis of a sexually transmitted infection, and 12.6% reported having ever had hepatitis C diagnosed. More than 90% of participants had been sexually active in the previous year, and almost half reported more than one partner. Involvement in commercial sex was uncommon, and most participants reported having had sex while drunk or high in the previous year. Of those who reported having been sexually active in the previous year, only 13.8% had always used condoms, and 22.6% had used a condom the last time they had had intercourse.

More than half the participants reported use of opioids, crack, cocaine or methamphetamine in the previous year, as shown in Table 2. Of all participants, 12.2% had injected drugs in the

Table 3. Associations from bivariate logistic regression between drug use and socio-demographic and behavioural factors in adult male inmates at a provincial correctional facility in Southern Ontario, 2009

Characteristic		Any drug use* OR (95% CI)	Injection drug use* OR (95% CI)
Age group	18-24	1	1
	25-34	1.71 (1.08–2.73)	3.64 (1.44–9.22)
	35-44	2.03 (1.20–3.42)	5.17 (2.01–13.3)
	>44	0.77 (0.46–1.31)	2.87 (1.02–8.06)
Marital status	Married	1	1
	Common law	1.82 (0.83–3.98)	1.44 (0.38–5.49)
	Single	2.33 (1.15–4.73)	1.50 (0.44–5.14)
	Separated	3.00 (1.11–8.08)	3.67 (0.88–15.3)
	Divorced	1.70 (0.61–4.78)	0.96 (0.15–6.19)
STI ever diagnosed	No	1	1
	Yes	1.34 (0.87–2.06)	1.28 (0.69–2.37)
Hepatitis C ever diagnosed	No	1	1
	Yes	7.46 (3.33–16.7)	12.2 (6.58–22.7)
Number of partners in past year	0	1	1
	1	1.29 (0.68–2.44)	0.90 (0.29–2.83)
	2-6	2.64 (1.38–5.04)	2.15 (0.72–6.39)
	>6	5.63 (1.94–16.3)	3.14 (0.83–11.8)
Commercial sex involvement in past year	No	1	1
	Yes	10.3 (1.34–79.7)	5.84 (1.95–17.4)
Sex while intoxicated in past year	No	1	1
	Yes	3.32 (2.20–5.00)	4.03 (1.69–9.60)
Unprotected sex in past year	No	1	1
	Yes	1.25 (0.82–1.92)	1.29 (0.65–2.58)

* Including opioids, cocaine, crack or methamphetamine.
OR=odds ratio; CI=confidence interval; STI=sexually transmitted infection.

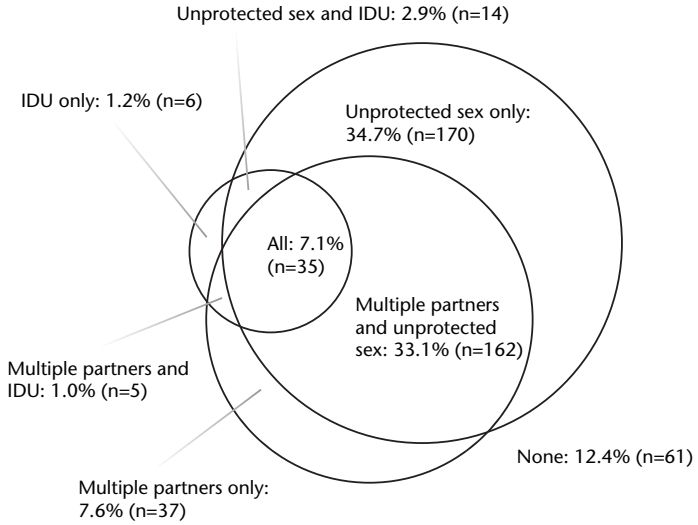

Figure 1. Venn diagram showing overlap in previous-year risk behaviours* in adult male inmates in a provincial correctional facility in southern Ontario, 2009, n=490†

Sizes of circles are approximately proportionate to the number of persons they represent.
* Risk behaviours shown in the figure are injection drug use (IDU), unprotected sex and multiple partners.
† Includes all those for whom data were provided. For participants who did not report the number of partners in the previous year, we used data on the number of partners in the previous three months if the participant reported more than one partner during that time.

previous year. Of those who used any opioids, crack, cocaine or methamphetamine, 21.6% had injected drugs, 60.4% had snorted or sniffed drugs, 54.1% had smoked drugs, and 33.6% had swallowed drugs. More than a third of all study participants had used cocaine and opioids other than heroin, and almost a third had used crack. More than 7% had used heroin, and 6.0% had used methamphetamine.

Socio-demographic factors that were significantly associated in bivariate analysis with use of any opioids, cocaine, crack or methamphetamine in the previous year were age 25 to 44 years compared with age 18 to 24 years and being single or separated compared with being married (Table 3). Commercial sex involvement, sex while intoxicated and prior diagnosis of hepatitis C were each strongly associated with any drug use. Participants were more than twice as likely to report any drug use in the previous year if they had had between two and six partners or more than six partners in that time than if they had had no partners.

Injection drug use in the previous year was associated with being 25 to 34, 35 to 44, and older than 44 years old vs. being 18 to 24 years old (Table 3). Significant associations were also identified for having had a diagnosis of hepatitis C, commercial sex involvement in the previous year and having had sex while intoxicated in the previous year.

Many participants reported multiple behaviours in the past year that could directly increase the risk of transmission of sexually transmitted and blood-borne infections, i.e., injection drug use, multiple sexual partners and unprotected sex. For those participants who provided data on all three of these behaviours (N=490), Figure 1 shows the overlap between the behaviours by representing the number and proportion of participants who engaged in each of them and in multiple behaviours. More than 85% of participants engaged in at least one of these three risk behaviours, 36.2% engaged in at least two risk behaviours, and 7.0% engaged in all three.

DISCUSSION

This study identifies high rates of recent drug use and risky behaviours in a large sample of newly arrested male inmates in a provincial correctional facility in Ontario. This research provides the first Canadian data in the past decade on drug use by recently arrested adult inmates. More than half of participants reported any opioid, cocaine, crack or methamphetamine use in the previous year, and more than one tenth reported having injected drugs.

A strength of this study is the examination of factors associated with drug use, including sexual risk behaviours, which has been lacking from other studies of drug use in incarcerated populations in Canada.[6-10,12,13] Bivariate analysis revealed that drug use and injection drug use were both significantly associated with older age, with having ever received a diagnosis of hepatitis C, with commercial sex involvement in the previous year and with having had sex while intoxicated in the previous year, These data may inform prevention programs. In particular, the overlap in risky sexual and drug use behaviours (Figure 1) suggests that subgroups of incarcerated males are at particularly high risk of infection with and transmission of sexually transmitted and blood-borne infections. We suggest further exploration of the clustering of risk behaviours in a larger sample of incarcerated males, and a focus on prevention in these subgroups if it emerges that there is an additive or multiplicative increase in risk of infections with an increase in these risk behaviours.

Data on past-year drug use are more informative for health care and service delivery interventions than are data on lifetime drug use. Only one other Canadian study has reported past-year drug use in inmates; that study was conducted from 1996 to 1997 in Ontario.[9] Levels of non-cannabis drug use were similar in these two studies, at 51% in the Calzavara et al. study and 56.6% in our study. The prevalence of injection drug use was 17% in the Calzavara et al.[9] study and 12.2% in our study. This difference may represent a true decrease in injection drug use over time, which could be attributable to a shift from heroin to prescription opioid use, as has been hypothesized on the basis of data from the general population and federal inmates during this period;[7,25] in the Calzavara et al. study, 12% reported heroin use and 15% reported use of opioids other than heroin, whereas in our study 7.4% of participants reported heroin use and 35.3% other opioid use. The difference may be spurious, i.e., due to statistical chance or reflecting differences in drug use in inmates in the institutions sampled in each study.

Both the high prevalence of drug use and the lack of change over time in this prevalence bring into question whether adequate resources have been invested to address illicit drug use and its consequences in incarcerated people. A large population of current and former drug users and injection drug users are incarcerated in Canada; for example, about 45,000 people who are incarcerated each year have a history of injection drug use (30% of the estimated 150,000 people incarcerated each year).[9,26] Incarceration presents a unique opportunity to provide primary prevention programs for injection and non-injection drug users, such as vaccination against hepatitis A and hepatitis B, and linkage to treatment and harm reduction programs, including opioid substitution therapy, needle exchange, overdose prevention education and naloxone distribution programs. Given the empirical evidence of drug use within correctional facilities in Canada, including injection drug use, and transmission of infectious diseases,[6-9,12,27] such programs should be available in correctional facilities as well as in the community.[28]

There are several limitations to this study. Data were collected from a single provincial facility in Ontario, and drug use and risk behaviour patterns may vary across facilities and by region in Canada. The study participation rate was suboptimal; however, the similar age distribution of the sample to that of the admitted population suggests that the results are likely to be internally valid. While efforts were made to optimize confidentiality and to inform participants that their responses would not influence their treatment or sentencing, inmates may have felt uncomfortable disclosing their drug use and sexual behaviours; under-reporting would lead to an underestimate of prevalence and could bias associations in either direction (depending on which behaviours were underreported). We collected data only on use of substances and route of administration; data on frequency of use, history of overdose, indicators of dependence or abuse, and risk behaviours for blood-borne infections, such as sharing needles and drug paraphernalia, would also be informative. We asked only about the use of certain drugs that could lead directly to the transmission of blood-borne infections, i.e., through sharing of needles and other drug use paraphernalia; this is important to note when comparing these results with those of other Canadian studies and in applying the results for planning purposes, e.g., for assessing treatment needs. We did not collect data on certain risk factors of interest, e.g., sharing needles and drug use paraphernalia, as this was not relevant to the primary study objectives. Finally, while theory and empirical data suggest various factors that may cause drug use in this population,[29-32] including genetic factors, personality characteristics such as impulsivity and sensation-seeking, and social and environmental factors such as childhood abuse, we did not explore the root causes of drug use because it was beyond the scope of our study.

Further work is needed to better understand drug use by incarcerated populations in Canada and to mitigate its impacts, and this should include the period of incarceration. In addition to research describing the prevalence and socio-behavioural risk factors for drug use, intervention studies are needed to assess methods to reduce the harms of drug use. Current policies should be updated to reflect best practices for the treatment and management of drug dependency, for example, furthering the initiation of opiate substitution therapy in provincial correctional facilities,[33] which is not currently widespread in Ontario. By framing incarceration as an opportunity for a marginalized population to access health care and social services, it may be possible to reduce the morbidity and mortality associated with drug use in this population and in society overall.

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RÉSUMÉ

OBJECTIFS : Décrire la prévalence de la consommation de drogue dans la population carcérale masculine d'un centre de détention provincial durant l'année précédant l'incarcération et examiner l'association entre les facteurs sociodémographiques et comportementaux et la consommation de drogue.

MÉTHODE : En 2009, 500 hommes adultes ont rempli un questionnaire après leur arrivée dans un centre de détention provincial en Ontario. Les taux de prévalence de l'année antérieure ont été calculés pour la consommation d'opioïdes, de cocaïne, de crack et de méthamphétamine, et selon la voie d'administration de ces drogues. Une régression logistique bivariée a servi à examiner les liens entre la consommation de drogue et les facteurs sociodémographiques et comportementaux.

RÉSULTATS : Plus de 56 % des participants ont déclaré avoir consommé des opioïdes, de la cocaïne, du crack ou de la méthamphétamine au cours de l'année antérieure. Des facteurs de risque d'infections transmissibles sexuellement et par le sang ont souvent été déclarés pour l'année antérieure : 12,2 % s'étaient injecté de la drogue, 78 % avaient eu des rapports sexuels non protégés, et 48 % avaient eu plus d'une ou d'un partenaire sexuel. Selon nos analyses non ajustées, les participants de plus de 24 ans étaient plus susceptibles d'avoir consommé l'une de ces drogues et de s'être injecté de la drogue au cours de l'année antérieure.

CONCLUSIONS : Cette étude présente les premières données canadiennes de la dernière décennie sur la consommation de drogue chez des adultes récemment incarcérés. Nous constatons que la consommation de drogue et les comportements qui augmentent le risque de transmission des infections transmissibles sexuellement et par le sang sont encore très courants dans cette population. L'incarcération présente la possibilité d'offrir des services aux personnes qui consomment de la drogue et de les aiguiller vers des programmes, ce qui pourrait réduire les méfaits liés à la drogue au niveau individuel et sociétal.

MOTS CLÉS : prison; troubles dus à la consommation de drogue; troubles liés à une substance; drogues de rue