

Increasing Prevalence of Cocaine as the Primary Detoxification Diagnosis among Admissions Presenting with Current Intravenous Drug Use

A Review of Detoxification Records from Northern British Columbia, 1999-2005

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ABSTRACT

Objectives: This study sought to document the trends in drug use among intravenous drug users (IDUs) in northern British Columbia, and to discuss the public health implications.

Method: We conducted a 7-year medical-chart review of all IDU-related admissions (n=2072) to an inpatient alcohol and drug detoxification centre in Prince George, British Columbia. Primary detoxification diagnosis was modeled onto year of admission using generalized estimating equations (GEE).

Results: Our study demonstrated an increasing prevalence of cocaine as the primary detoxification diagnosis in IDU-related admissions in northern BC, from 32% of all IDU admissions in 1999 to 64% in 2001, and then a relatively steady elevated rate of approximately 60% between 2001-2005.

Conclusions: Given that needle exchange programs and other harm reduction services for IDUs in British Columbia are not readily available in many northern and rural areas, the risks associated with intravenous cocaine use among northern IDUs represent a serious public health challenge. Tailored harm reduction strategies should take into account the prominence of intravenous cocaine use as an HIV risk factor. In areas without well-established intravenous drug use monitoring programs, such as rural and remote areas, detoxification treatment records may serve as important sentinels for changing drug use patterns among IDUs.

Key words: Substance abuse, intravenous; cocaine; rural health services; treatment centers, substance abuse

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

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Intravenous drug use and its associated risk of infectious disease stand as prominent public health concerns in some northern Canadian communities, both urban and rural.¹⁻⁴ An understanding of the drug use trends among intravenous drug users (IDUs) informs tailored public health strategies,⁵ but few longitudinal surveillance studies have described the patterns of drug use among IDUs in northern Canada. Such surveillance studies are important because different IDU drug use patterns have varying levels of abuse liability, risk of infectious disease, and health service and needle exchange utilization.

While researchers have acknowledged that IDU populations are 'hidden' and representative samples are not possible,⁵ the World Health Organization has chosen substance abuse treatment IDU samples as important sentinels for drug use patterns in the larger IDU populations.^{6,7} Researchers have used other surveillance approaches to assess drug use patterns and infectious disease among IDUs, such as capture-recapture methods,⁸ respondent-driven sampling, and targeted sampling, for example.⁹ Given that few northern Canadian cities have any ongoing surveillance studies of IDUs, substance abuse treatment facilities in these northern communities may serve as pragmatic and current sources of intravenous drug use information. Therefore, we sought to determine the longitudinal intravenous drug use patterns between 1999-2005 among IDUs admitted to the only inpatient detoxification treatment program in the northern two thirds of British Columbia.

METHODS

This study was funded by internal funds from the Centre for Addiction and Mental Health and the Northern Health Authority. The Prince George Regional Hospital Research Review Committee gave ethical approval for this study.

Treatment setting

The Prince George Detoxification/Assessment Unit offers a voluntary 20-bed, mixed-gender inpatient detoxification program for both alcohol and drugs in Prince George, British Columbia. During the study period (1999-2005), major policies at the detoxification centre concerning accessibility and treatment protocols remained constant.

TABLE I

Demographic Characteristics of Intravenous Drug Users Admitted to Hospital-based Detoxification with a Primary Detoxification Diagnosis of Cocaine, January 1999 to December 2005

	Primary Drug of Detoxification, Cocaine* (n=532)
Age (Mean, SD)	33.6 (8.3)
Range	18.5-59.2
Unemployed	462 (87%)
No fixed address	178 (34%)
Married/Common law	80 (15%)
Aboriginal ethnicity	315 (59%)
Residence in northern BC (excluding Prince George)	107 (20%)
Gender (Male)	330 (62%)
Length of stay, hours (Mean, SD)	89.0 (72.7)
Number of drugs used problematically (Mean, SD)	2.4 (1.2)
HIV positive†	32 (6%)
Hepatitis C positive†	253 (48%)

* Current IDUs were classified as 'Primary drug of detoxification, cocaine' if they presented with cocaine as a primary drug of detoxification during the study period. Their first primary cocaine admission was selected for the purpose of this table.

† Based on self-report

TABLE II

GEE Modeling of Primary Cocaine Detoxification on Year of Admission

Year	Beta	SE(B)	Prevalence Ratio of Primary Cocaine Detoxification: Each Year Compared to 1999 (95% CI)	p value
1999	0.000	0.000	1.00 (Ref)	-
2000	0.540	0.122	1.72 [1.35, 2.18]	<0.001
2001	0.703	0.129	2.02 [1.57, 2.60]	<0.001
2002	0.565	0.121	1.76 [1.39, 2.23]	<0.001
2003	0.768	0.115	2.16 [1.72, 2.70]	<0.001
2004	0.594	0.120	1.81 [1.43, 2.29]	<0.001
2005	0.734	0.119	2.08 [1.65, 2.63]	<0.001

Participants

Among the 3,689 individuals (1,286 females) admitted to the Detoxification/Assessment Unit at the Prince George Regional Hospital between January 4, 1999 and December 31, 2005, 828 individuals (303 females) reported 'current' intravenous drug use (IDU within the previous 2 months) in at least one detoxification episode.

Data collection

At admission, the patient was interviewed to assess demographic and drug use information. A physician would meet with the patient within 24 hours of admission to assign a detoxification diagnosis and medication protocol (if needed). Out of the total 2,072 IDU-related admissions during the study period, 279 treatment episodes lasted less than 24 hours; in these instances we relied on the detoxification diagnosis of the nurse.

Medical-chart review

After the patient was discharged, the medical chart was organized for chart abstraction and data entry, according to a standardized protocol. We used traditional

data cleaning techniques to spot possible data entry errors.¹⁰

Key variables

The variable 'primary detoxification diagnosis' referred to the patient's principal withdrawal syndrome diagnosed by the physician. Two and a half years after the initiation of the study, the medical charts also began to contain specific information about the patient's 'most frequently injected drug'. In almost all admissions indicating a primary cocaine or primary heroin/opiate diagnosis, the primary detoxification diagnosis stood as a reliable proxy for the drug most frequently injected. For example, in the available data, 93% of intravenous drug user admissions with a primary detoxification diagnosis of cocaine also reported cocaine as the most frequently injected drug. Likewise, 84% of intravenous drug user admissions with a primary detoxification diagnosis of heroin/opiates also indicated heroin/opiates as the most frequently injected drug. It is important to note that we did not use the variable 'most frequently injected drug' in the GEE (generalized estimating equa-

tions) analyses because of completely missing data from the beginning of the study period to June 2001. We present a detailed description of current intravenous drug users admitted with a primary detoxification diagnosis of cocaine in Table I.

Statistical analyses

Primary detoxification diagnosis was modeled onto year of admission using generalized estimating equations. The GEE statistical procedure represents an extension of binomial regression for modeling recurrent event data within individuals.¹¹ The GEE procedure requires a binary dependent variable and, given our chief interest in primary intravenous cocaine use over the 7-year period, we collapsed the primary detoxification diagnoses into 2 categories: primary detoxification diagnosis of cocaine versus all other primary drug detoxification diagnoses. Prevalence ratios were determined using log-binomial GEE models for binary outcomes.

RESULTS

The sample of IDUs (n=828) accounted for 2,072 admissions over the 7-year study period, with a median of 1 visit [interquartile range (IQR): 1-3 admissions]. Approximately 20% of all admissions to the Unit each year were IDU-related.

For the purposes of modeling primary detoxification diagnosis on year of admission, the four primary detoxification diagnosis categories were collapsed into cocaine versus all other drugs. The GEE modeling procedure demonstrated an increasing trend of cocaine as the primary detoxification diagnosis among yearly admissions, especially in the period between 1999-2001. During the period from 2001-2005, cocaine as the primary detoxification diagnosis was assigned to approximately 60% of all IDU admissions. Diagnoses of opiates as the primary drug of detoxification appeared to dip during the years 2000-2003, and then returned to baseline-year levels in 2004-2005.

As demonstrated in Table II, those patients admitted in 2000 were 1.72 times more likely to be admitted for cocaine detoxification in comparison to those admitted in 1999 (p<0.001). Likewise, each subsequent year showed a significantly elevated rate of primary cocaine-related

admission in comparison to 1999. Even though the GEE procedure required us to model a binary outcome (i.e., primary cocaine detoxification diagnosis versus other) across year of admission, we present in Figure 1 yearly admissions across the 4 categories of primary drug of detoxification in order to help the reader gain a more detailed picture of the trends in primary drug of detoxification diagnoses among current IDUs at the study site.

DISCUSSION

Our results showed an increasing prevalence of cocaine detoxification episodes among IDU-related admissions to the study site, especially in the period between 1999-2001. In almost all episodes, cocaine as the primary detoxification diagnosis corresponded to cocaine as the most frequently injected drug. Intravenous drug use is an important public health issue for rural and urban communities in northern BC, especially given that a substantial proportion of IDUs reported residence outside of Prince George, BC. Given that needle exchange programs and other harm reduction services for IDUs are not readily available in most of the northern and rural areas in BC,¹² the risks associated with intravenous cocaine use may be amplified.

The prominence of cocaine as the most frequently injected drug among IDUs in our study is similar to the patterns seen in the I-Track study, a national surveillance of HIV/HCV-associated risk behaviours among IDUs in urban and semi-urban sites across Canada. In both cycles of the I-Track surveillance between 2002-2005, 45% of all IDUs in the study reported that cocaine was the most commonly injected drug in the last six months, although this rate varied widely from 26% in Toronto to 70% in Victoria. This elevated pattern of intravenous cocaine use may be associated with the sustained reduction in the availability of heroin and the increased supply of cocaine not only in BC, but also across Canada during the course of the study period.^{13,14} In comparison to other IDU usage patterns, intravenous cocaine has been strongly associated with more frequent injections,¹⁵ more frequent needle sharing,¹⁶ heightened sexual risk-taking,^{17,18} more frequent use of shooting galleries,¹⁹ poorer health,¹⁶ increased levels of crimi-

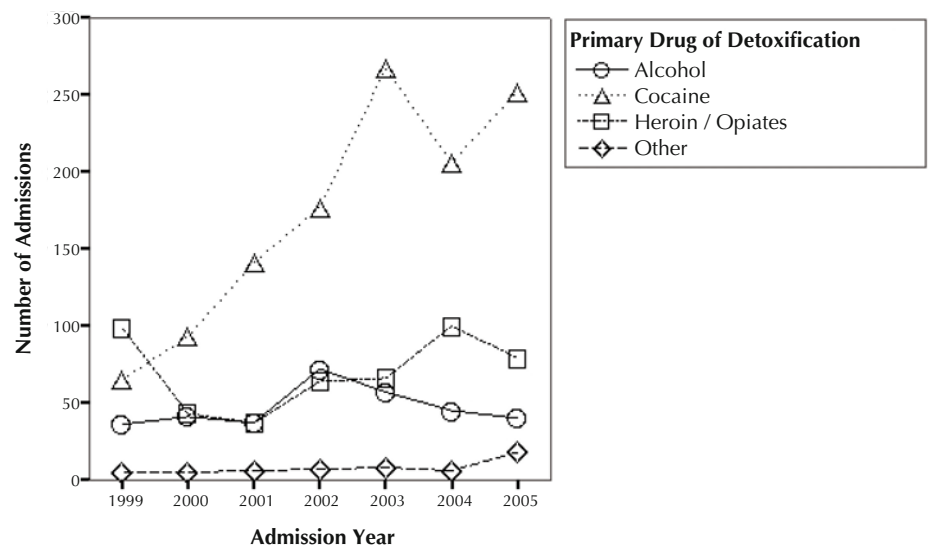


Figure 1. Primary detoxification diagnoses assigned to all admissions reporting current intravenous drug use over a 7-year period, 1999-2005

nality¹⁶ and violence,²⁰ and higher HIV seroincidence.^{19,21,22} In northern and rural areas, the relatively greater burden of intravenous cocaine use may pose substantial challenges to health care and harm reduction programs.

Our study also addresses the value of utilizing detoxification records to inform public health issues. Intravenous drug users represent a substantial proportion of all admissions to alcohol and drug detoxification services. During the 7-year period at our study site (1999-2005), for example, 23% of all admissions reported current intravenous drug use. Likewise, in the 2003 Treatment Episode Data Set, the annual compilation of data on entry into publicly funded substance abuse treatment across the United States, IDU-related admissions accounted for 22% of all detoxification episodes.²³ Given the large number of IDUs accessing withdrawal management treatment, this modality can be used to gather information on what is otherwise a largely 'hidden' population.

The findings of this paper must be considered in the context of a number of important considerations and limitations. This study did rely upon the self-reports of patients undergoing medically supervised substance abuse withdrawal. It is important to note that patients stayed in the Unit on average 3-4 days, a duration providing the staff ample time to verify medical chart information and to check any suspect self-reports. Systematic and stan-

dardized information on the duration, frequency, and intensity of primary drug use, intravenous drug use, and other problematic drug use was not available in the medical charts. In this way, it is difficult to assess the addiction severity of the primary drug of choice or the use severity of other self-reported problematic drugs. Nonetheless, previous research has shown that patients' self-reports of drug use are reasonably reliable and valid, especially when events are recent and patients do not face negative consequences for their answers.^{24,25} The trends described in this study relied on detoxification episodes and, as a result, the primary drug-use trends in our study may not extend directly to the larger IDU population in northern British Columbia.

In summary, intravenous cocaine use among northern IDUs represents a serious public health challenge, especially given that needle exchange programs and other harm reduction services for IDUs are not as available in northern and rural areas. Tailored harm reduction strategies in northern British Columbia should take into account the prominence of intravenous cocaine use as an HIV risk factor. Our paper also demonstrates that detoxification centres, especially those in northern and rural areas, can serve as key sites not only for monitoring drug use patterns among IDUs, but also for integrating public health and withdrawal management services for this population.²⁶

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RÉSUMÉ

Objectifs : Notre étude visait à documenter les tendances de la consommation de drogue chez les utilisateurs de drogue injectable (UDI) dans le Nord de la Colombie-Britannique et à examiner leurs conséquences pour la santé publique.

Méthode : Nous avons examiné les fiches médicales sur 7 ans de toutes les hospitalisations d'UDI (n=2 072) dans un centre de désintoxication de Prince George (Colombie-Britannique). Le principal diagnostic de désintoxication a été modélisé sur l'année d'hospitalisation à l'aide d'équations d'estimation généralisées (EEG).

Résultats : L'étude a montré une prévalence croissante de l'abus de cocaïne comme principal diagnostic de désintoxication dans les hospitalisations liées à l'utilisation de drogues injectables du Nord de la Colombie-Britannique; ce diagnostic est passé de 32 % des hospitalisations d'UDI en 1999 à 64 % en 2001, puis il s'est stabilisé à un niveau relativement élevé (environ 60 %) entre 2001 et 2005.

Conclusion : Étant donné que les programmes d'échange de seringues et autres services de réduction des méfaits destinés aux UDI en Colombie-Britannique ne sont pas aisément accessibles dans de nombreuses régions nordiques et rurales, les risques associés à l'injection de cocaïne chez les UDI du Nord présentent un défi de taille pour la santé publique. Les stratégies de réduction des méfaits adaptées doivent tenir compte de la prédominance de la consommation de cocaïne par voie intraveineuse comme facteur de risque du VIH. Dans les secteurs qui n'ont pas de programmes établis pour la surveillance de l'utilisation de drogues injectables, les régions rurales et éloignées par exemple, les dossiers des centres de désintoxication peuvent être d'importantes sentinelles des changements dans les habitudes de consommation de drogue des UDI.

Mots clés : abus de drogues intraveineuses; cocaïne; services de santé ruraux; centres de désintoxication