

Trends in methamphetamine use in northern BC, 2001–2005

A recent study assessed the impact of methamphetamine use on adolescents at an inpatient youth addiction treatment site in Prince George, British Columbia.

ABSTRACT

Background: In countries experiencing elevated rates of adolescent methamphetamine-related problems, addiction-treatment records have served as a sentinel source of data for understanding the scope and spread of methamphetamine use. In an attempt to obtain such data in a Canadian setting, we studied the 5-year trends in primary drug use among patients at the only adolescent inpatient substance-abuse treatment facility in northern British Columbia.

Methods: All adolescents admitted to the hospital-based study site during the study period (N=520) completed an extensive assessment package for inclusion in their medical charts. Patients then participated in a 28-day program including cognitive-behavioral therapy, family systems therapy, and narrative ther-

apy. Using the information abstracted from the medical charts after patients were discharged, we then conducted a review of all consecutive admissions (N=671) from March 2001 to December 2005.

Results: The medical chart data indicated that primary methamphetamine-related admissions to inpatient treatment increased significantly in 2003 to approximately 35% of all admissions, and that this elevated admissions rate remained relatively steady throughout 2004 and 2005.

Conclusions: Primary methamphetamine use has had a significant impact on inpatient youth addiction treatment in northern British Columbia. Addiction-treatment records can serve as an important component in the surveillance of adolescent drug-use trends.

In British Columbia, methamphetamine use among adolescents has become an apparent public health concern. Most of the available data on methamphetamine use in British Columbia comes from school-based surveys. For example, the McCreary Centre's 1998 and 2003 British Columbia adolescent health surveys, which questioned approximately 25 000 to 30 000 students in grades 7 to 12 in each survey cycle, found that lifetime use of amphetamines (a category including methamphetamine) remained relatively low

Dr Callaghan is a scientist at the Centre for Addiction and Mental Health, Toronto, Ontario. He is also an addiction-treatment consultant with the Northern Health Authority, Prince George, BC, and an assistant professor at the University of Toronto. Mr Victor is a statistical analyst at the Ontario Tobacco Research Unit in Toronto. Dr Matsuba is an assistant professor at the University of Northern British Columbia in Prince George. Mr Manning is a teacher in School District 57 in Prince George. Mr Taylor is a research analyst at the Centre for Addiction and Mental Health in Toronto. Mr Lentz is a youth addictions counselor with the Northern Health Authority in Prince George.

and constant at 4% to 5%.¹ In a study conducted in 2003, Lampinen and colleagues found that the rate of crystal methamphetamine use in the previous year stood at 2.6% in a convenience sample of students (N = 580) in four Vancouver and two Victoria high schools.² In addition, the 2004 Canadian Addiction Survey (CAS), a population-based survey of Canadians' alcohol and drug use, found that the rate of lifetime amphetamine use (which includes methamphetamine use) for respondents aged 15 to 19 years was 8.3%.³

In general, the available studies indicate that the prevalence of methamphetamine use is relatively low in the broad population of adolescents in British Columbia. An important limitation of the McCreary and CAS results is that both research projects collected information on the more inclusive drug class of amphetamines rather than on methamphetamine specifically. As a result, it is difficult to extrapolate definite patterns of methamphetamine use among adolescents in British Columbia using the data from these studies.

In other countries experiencing elevated rates of adolescent methamphetamine-related problems, addiction-treatment records have served as a sentinel source of data for understanding the scope and spread of methamphetamine use.⁴ To obtain such data in a Canadian setting, we conducted a 5-year medical chart review of all consecutive admissions (N = 671) from March 2001 to December 2005 to an inpatient, substance-abuse treatment facility for youth.

Methods

The site where the study took place is the only hospital-based substance-abuse treatment facility for youth in the northern two-thirds of the province of British Columbia. Located in the

city of Prince George (pop. 84 000), the facility provides a 28-day voluntary substance-abuse treatment program for eight adolescent inpatients at one time. Adolescents can gain admission to the treatment centre through self-referral, or with a referral from their legal guardian, physician, health service worker, school official, or a mental health or criminal justice professional.

The treatment site does not offer drug-specific programs, but rather a general, manual-guided alcohol-and-drug treatment package. The treatment program is multimodal, relying primarily on principles and techniques of cognitive-behavioral therapy (CBT), family systems therapy,⁵ and narrative therapy.⁶ The primary therapeutic modality is group therapy, which is scheduled for approximately 3 hours per day. The 28-day treatment program is composed of seven 4-day treatment modules: (1) family relationships, (2) conflict resolution, (3) emotions and feelings, (4) self-identity, (5) anger management, (6) loss and grief, (7) decision making. In addition, the last week incorporates a manual-guided CBT-based module on relapse prevention for adolescents.⁷ The centre's treatment approach encourages and directs the youth to:

- Perform a broad functional analysis of a wide range of life domains in

order to identify patterns of substance use, skill deficits, and dysfunctional attitudes and cognitions.

- Learn and use coping strategies to deal effectively with drug/alcohol craving, negative moods (modules 3 and 6), anger (module 5).
- Increase and strengthen problem-solving and communication skills (module 2).
- Develop the ability to anticipate and

The rate of lifetime amphetamine use (which includes methamphetamine use) for respondents aged 15 to 19 years was 8.3%.

avoid high-risk drug-using situations (module 7 and relapse prevention module).

- Identify and participate in enjoyable activities incompatible with drug use, such as the daily group exercise and entertainment scheduled during treatment.

Medical chart review

For the purposes of the study, each youth admitted to the facility completed an extensive assessment package, which was then included in his or her medical chart. After a youth was discharged, the administrative clerk at the treatment centre abstracted the medical chart information using a structured review process. In our medical chart review, we collected information on adolescents' self-reported primary drug of choice. Ethics approval for the study was obtained from the Northern Health Authority Transition Research Committee.

Table 1. Demographic characteristics of 520 adolescents admitted to inpatient substance-abuse treatment in northern British Columbia.

	Age mean years (SD)	Male n (%)	In school n (%)	Aboriginal n (%)
Primary methamphetamine-using inpatients (n = 134)*	16.9 (1.3)	53 (40%)	66 (49%)	31 (23%)
Primary non-methamphetamine-using inpatients (n = 386)*	16.8 (1.4)	172 (45%)	206 (53%)	170 (44%)
<i>P</i> value	.27	.31	.41	<.001

* Categorized by self-reported primary drug of choice at first admission during study period

Table 2. GEE modeling of primary methamphetamine admissions throughout year of admission.

Year	β	SE(β)	Prevalence ratio of primary methamphetamine admissions compared with previous year (95% CI)	<i>P</i> value
2001	0.000	—	1.00 Ref	—
2002	−0.029	0.341	0.97 (0.50, 1.90)	.933
2003	1.098	0.232	3.00 (1.90, 4.73)	<.001
2004	−0.075	0.171	0.93 (0.66, 1.30)	.662
2005	0.009	0.186	1.01 (0.70, 1.45)	.963

Statistical analyses

A general estimating equation (GEE) approach was used to estimate the prevalence ratio of primary methamphetamine-related admissions for the 5-year period. The GEE model accounts for an individual's multiple admissions over time. For the purposes of modeling the trends in primary drug of choice across the year of admission, the primary drug of choice categories were collapsed into methamphetamine and non-methamphetamine.

Results

Our medical chart review included 520 adolescents, who accounted for 671 admissions to the study site from March 2001 to December 2005. The demographic characteristics of adoles-

cents admitted to the program can be found in **Table 1**. The GEE statistical modeling procedure demonstrated a pattern of increasing identification of methamphetamine as the primary drug of choice among admissions over the course of the study. As demonstrated in **Table 2**, youth admitted in 2002 were not significantly more or less likely than youth admitted in 2001 to identify methamphetamine as their primary drug of choice. However, youth admitted in 2003 were 3 times as likely as those admitted in 2002 to identify methamphetamine as their primary drug of choice ($P < .001$). After 2003, there were no further significant changes in the relative prevalence of primary methamphetamine-related admissions (see **Figure**).

Our 5-year medical chart study

demonstrated that methamphetamine use has had a significant impact on inpatient youth addiction treatment in northern British Columbia. Primary methamphetamine-related admissions to inpatient treatment increased significantly in 2003 to approximately 35% of all admissions, and this elevated admissions rate remained relatively steady throughout 2004 and 2005.

A number of factors may account for the apparent disjunction between the relatively high rates of primary methamphetamine-related treatment admissions and the low rates of amphetamine use (including methamphetamine) in school- and population-based surveys. It is likely that the sample of treatment-seeking adolescents studied represents a more marginalized, at-risk population—a group outside the reach of school- or population-based surveys. For example, in our treatment sample, roughly half of the youth were not currently enrolled in school at the time of admission. In addition, other researchers have found high rates of methamphetamine use in the last year among street-involved youth and lesbian/gay/bisexual/transgender/questioning (LGBTQ) youth in Vancouver and Victoria.^{2,8} At this time, the available evidence shows that elevated patterns of methamphetamine use appear in more marginalized, high-risk groups of adolescents, but not in the broader population of British Columbia high school students.

In our study, non-Aboriginal adolescents were significantly more likely to present to inpatient substance-abuse treatment with methamphetamine as their primary drug of choice. This pattern is difficult to interpret. Aboriginal adolescents were more likely to be drawn from the northeast and northwest of the treatment centre's catchment area. It is possible that elevated rates of adolescent methamphetamine

use in northern British Columbia may be situated in relatively urban locations, as opposed to outlying areas. Future research will need to examine this pattern in more detail.

The heightened rates of the primary methamphetamine-related admissions also raise concerns about appropriate substance-abuse treatment strategies, but relatively little empirical evidence currently exists to guide a best-practices approach for treatment of adolescent methamphetamine abuse and dependence. The Matrix Model, a manual-guided outpatient treatment program integrating cognitive-behavioral therapy, contingency management, and motivational interviewing, stands as the most prominent therapeutic approach for methamphetamine abuse and dependence.⁹ Some studies have demonstrated that primary methamphetamine-using and non-methamphetamine-using adolescents manifest similar treatment-completion rates in CBT-based outpatient and inpatient treatment programs.^{10,11} Also, studies have found that primary methamphetamine users have similar treatment-completion and readmission patterns when compared with primary cocaine, heroin, or other opiate users, but worse outcomes than primary alcohol or marijuana users.^{12,13} In adult samples, methamphetamine-specific treatment has not produced superior posttreatment improvement when compared with results from a range of standard treatment-as-usual protocols.¹³ It is possible that future methamphetamine-specific treatment programs may produce relatively greater improvements for adolescent methamphetamine users, especially as more becomes known about the clinical detriments of methamphetamine abuse and dependence. At this time, however, researchers have not yet demonstrated the superiority of methamphetamine-specific treatment

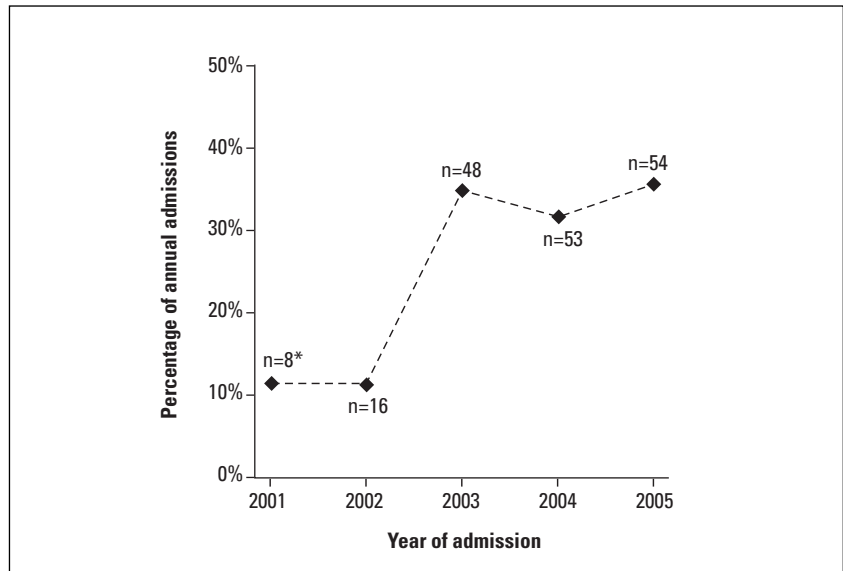


Figure. Pattern of primary methamphetamine admissions to the study site, March 2001–December 2005.

*Annual number of primary methamphetamine admissions

approaches over a number of standard treatment-as-usual protocols, including general CBT-based alcohol-and-drug approaches.¹³

The results discussed here must all be interpreted in light of several limitations. Our statistical analyses relied on a grouping strategy based on the clients' self-reported primary drug of choice. In a large majority of cases, misuse of the primary drug of choice was also the main reason for seeking treatment. However, it is important to note that almost all of the adolescents admitted to the treatment centre reported polydrug use. In addition, the treatment data in our current study cannot be used to make prevalence estimates for adolescent drug abuse in northern British Columbia. Our data only represent the drug use patterns of adolescents entering inpatient substance-abuse treatment and likely exclude a majority of adolescent drug users who are unable to access inpatient treatment or who do not seek such treatment.

Conclusions

Despite the limitations described here, the study makes a number of important contributions to the literature on adolescent methamphetamine use in Canada. Most of the available studies have focused on methamphetamine use in major Canadian cities, and little information exists about patterns in northern and rural areas of British Columbia. Our study demonstrated a dramatic increase of primary methamphetamine use among treatment-seeking adolescents over a 5-year period in northern British Columbia. As a result, our study indicates that methamphetamine use has had a major impact on inpatient youth addiction treatment in the study site's catchment area, which encompasses the northern two-thirds of the province. In addition, the study adds to the emerging evidence that elevated rates of methamphetamine use appear to be situated in more marginalized, at-risk groups of adolescents—for example,

Methamphetamine use has had a major impact on inpatient youth addiction treatment in the study site's catchment area, which encompasses the northern two-thirds of the province.

youth seeking substance-abuse treatment, street youth, adolescents reporting LGBTQ status—rather than in the broader population of adolescents in British Columbia. In addition, our results show that addiction-treatment records can serve as an important component in the monitoring of adolescent drug-use trends.

Competing interests

None declared.

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