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BRIEF COMMUNICATION

Recreational drug use in type 1 diabetes: an invisible accomplice to poor glycaemic control?

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Abstract

Recreational drug use during 'rave' parties is increasingly popular, but the impact of recreational drug use in type 1 diabetes (T1D) is not known. We determined the self-reported pattern and effects of recreational/illicit drug use in Australians with T1D people by inviting people with T1D to participate in an anonymous online/paper survey of drug use, through national radio broadcast and online/hospital advertising. Of the people with T1D who responded to our survey, more than three quarters reported having used recreational/illicit drug, but few people had informed health professionals about drug use. Drug use was associated with worse glycaemic control and higher risk of diabetic ketoacidosis. Medical awareness of common, currently underreported, drug use in young people with T1D is essential. It offers the possibility of helping such patients improve related suboptimal metabolic control.

Table 1 Pattern of drug use amongst respondents in the survey. Numbers represent percentage of total number of respondents ($n = 504$)

Drugs	Drugs ever used†	Drugs recently used‡	Daily use	Weekend use	'Party' use
Methylenedioxymethamphetamine (Ecstasy)	64	19	1	8	48
Methamphetamine (Speed)	52	11	2	7	35
Dextromethamphetamine (Ice)	16	1	1	4	8
Ketamine	10	1	0	1	8
Methylenedioxyamphetamine ('Love pill')	1	0	0	1	1
Heroin	7	0	0	0	4
Methcathinone ('Cat')	1	0	0	0	0
Methylenedioxyethamphetamine ('Eve')	1	0	0	0	0
Phencyclidine	1	0	0	0	1
Cannabis	88	14	19	22	1
Cocaine	40	7	1	5	1
Any illicit drug	77	47	24	48	100

†Drugs ever used in the past. ‡Drug use within the last 12 months.

Recreational use of illicit drug is an important health issue globally.[1–3] Approximately 10% of the general population has problems related to drug use, and young adulthood is the peak time for developing such a problem.[4,5] In the USA, 18- to 25-year-olds are three times more likely to have an alcohol or substance use disorder than younger or older people (21% vs 9% and 7% respectively).[6] In the 2004 National Drug Strategy Household Survey in Australia, the prevalence of recreational drug use exceeded 30% among young adults.[7]

Recreational drug use causes significant physical and psychological complications, especially in people with comorbidities. Management of type 1 diabetes (T1D) in young adults who use drugs is difficult partly because of paucity of data on the pattern and impact of drug use among young people with T1D. We and others have described life-threatening diabetic ketoacidosis (DKA) in the setting of recreational drug use in T1D.[8–11] It is possible that recreational drug use contributes relatively commonly to poor metabolic control in young people without being identified. This study examines recreational drug use among young people with T1D in Australia from an anonymous survey. The aim was to investigate the self-reported pattern and impact of recreational drug use in Australians with T1D.

Two collection modes were used in the survey: web-based and paper questionnaires. People with T1D in Australia were recruited through radio broadcast, hospital advertising, and a consumer network newsletter and online community. Respondents were asked 10 questions encompassing demographic details and pattern of drug use. A general invitation was extended to all people with T1D, regardless of whether they used or did not use drugs. The Human Research Ethics Committee, St Vincent's Hospital approved the studies.

The data were analysed with the use of SPSS Statistics version 17 (SPSS, Chicago, IL, USA). Results are expressed as mean ± SD. Differences in continuous variables were analysed by the unpaired *t*-test. Differences between categorical variables were assessed using the chi-square test. Odds ratio and confidence intervals were determined by multinominal logistic regression. $P < 0.05$ was considered statistically significant.

As the survey was broadcasted nationally, total response rate of the survey could not be determined. Of a total number of 504 respondents in the survey (331 female, age 31 ± 1 years), 388 (77%) had used drugs at least once and 237 (47%) had used drugs within the last year. Regarding tobacco and alcohol consumption, 28% were smokers and 48% consumed more than 20g of alcohol per day on a regular basis. Table 1 summarises the pattern of drug use among the respondents. Among those who used drugs, 24% reported daily use and 68% were poly-drug users (≥3 drugs). The six most common drugs were cannabis (88%), 'Ecstasy' (63%), 'Speed' (51%), cocaine (40%), 'Ice' (19%) and ketamine (15%).

In contrast to tobacco smoking, which was most prevalent among 25- to 29-year-olds (37%), recreational drug use was the most common among persons less than 20 years old (80%) and least common between 25 and 29 years (72%). The most common mode of drug use was smoking (37%), followed by ingestion (32%) and snorting (27%). Five per cent injected intravenously. 'Speed' and 'Ice' constituted two thirds of intravenous drug use.

Drug users were similar in age and gender to non-users (Table 2). Drug users were significantly more likely to smoke tobacco, but less likely to consume excess alcohol regularly. Fewer drug users (73%) remembered their last

Conflict of interest: None.

Table 2 Comparison of characteristics between drug users and non-users

	Drug users	Non-drug users	*P*-value
Number	388	116	—
Mean age	30 (2)	32 (2)	NS
	Range [13–44]	Range [15–42]	
% of female	79	63	NS
% of respondents			
Never been hospitalised with DKA	78	84	0.07
Hospitalised once	15	12	NS
Hospitalised more than once	7	4	NS
Knew their last HbA1c	76	96	0.02
Last HbA1c	8.4 (2.1)	7.6 (1.6)	0.03
% tobacco smokers	34%	9%	<0.01
% regular drinkers†	47%	53%	NS

†Consumes more than 20 g of alcohol per day. NS, not significant; DKA, diabetic ketoacidosis.

HbA1c compared with non-users (96%, $P = 0.02$). HbA1c was higher among drug users than non-users (8.4 ± 2.1 vs 7.6 ± 1.6%, $P = 0.03$). Two thirds of drug users had informed their partners and/or friends about their drug use, while less than a quarter had informed family. Seven per cent had informed health professionals, and 23% of drug users had told no one about drug use.

Factors associated with poor glycaemic control (HbA1c ≥9%) were evaluated by examining the association of glycaemic control with age, sex, duration of diabetes, smoking history and drug use. In univariate analyses (Table 3), poor glycaemic control was associated with younger age, tobacco smoking and drug use. All three factors remained significant in multivariate analyses, with drug use the strongest variable. The likelihood of having poor glycaemic control was tripled among drug users compared with non-users (Table 3). Fourteen ex-drug users reported changes in their HbA1c. Drug cessation was associated with a reported 29% reduction in HbA1c.

Among the 200 respondents who answered this question, close to one third reported not checking blood glucose levels when using drugs. An increase in blood glucose during drug use was reported by 17% of patients, while a decrease in 13%.

More than two thirds of respondents reported not altering their insulin dose during drug use, while almost 20% omitted insulin before drug use. A minority either increased (5%) or decreased the dose (4%). Twenty-two respondents reported DKA following illicit drug use. Four respondents (all Ecstasy users) claimed the need to increase their insulin dose by 100–150% (all taking insulin glargine) to reduce hyperglycaemia.

Little is known about the pattern of drug use among young people with T1D by their treating doctors.[9] Through an anonymous national survey, the current study reports that drug use is common among respondents. Most importantly, a significant association exists between drug use, and both underreporting and poor glycaemic control.

Table 3 Factors associated with poor glycaemic control (HbA1c ≥9%)

Variable	Univariate analysis		Multivariate analysis	
	Odds ratio (95% CI)	*P*-value	Odds ratio (95% CI)	*P*-value
Sex Female versus male	0.7 (0.4–1.4)	NS	0.7 (0.4–1.4)	NS
Age <31 versus ≥31 years	2.3 (1.2–4.4)	0.01	2.6 (1.2–5.5)	0.01
Duration of diabetes <15 versus ≥ years	1.6 (0.9–2.9)	NS	1.1 (0.5–2.1)	NS
Smoking Smoker versus non-smoker	2.1 (1.1–3.8)	0.03	2.1 (1.0–4.2)	0.04
Drug use Users versus non-users	4.1 (1.6–10)	0.002	3.0 (1.2–7.8)	0.02

CI, confidence interval; NS, not significant.

All respondents reported drug use during parties, many on weekends (Table 1). The risk of hyperglycaemia, ketosis and acidosis in T1D is magnified in the setting of 'rave' parties.[8] Insulin non-compliance is common during a 'rave', and more than 20% of respondents reported omission or reduction of insulin before drug use, which may explain the high rate of DKA, especially with concurrent stimulant use. Stimulants increase release of catecholamines and cortisol, hormones that enhance gluconeogenesis, glycogenolysis and lipolysis, thus fuelling hyperglycaemia and the formation of ketones.[8]

Based on self-reported HbA1c, drug users in the current study had significantly worse glycaemic control than non-users, with reported improvement following cessation. In this group, drug use was the strongest factor associated with poor glycaemic control, independent of age, gender, duration of diabetes and tobacco smoking. As the evaluation was based on self-reported HbA1c, the findings must be interpreted with caution. However, significantly fewer drug users knew of their last HbA1c (Table 2). One may speculate that the drug users who did not know their last HbA1c have higher HbA1c levels. Drug use may coexist with other high-risk behaviours, and drug-taking may indicate poor social support, chaotic lifestyle and maladjustment to a chronic illness. This is consistent with the reported high mortality from acute diabetes-related events associated with drug abuse.[12]

It is uncertain how diabetes should be managed during drug use, particularly whether insulin dosage requires adjustment. Variable effects on glycaemia were reported in the current study. Although stimulants classically lead to catecholamine excess, resulting in hyperglycaemia by inhibition of insulin secretion, hyperglucagonaemia, and enhancement of gluconeogenesis and glycogenolysis,[8] increased insulin dosage needs to be balanced against potential hypoglycaemia from missed meals, increased activity and other drug or alcohol effects.[11] Adjustment of insulin dosage should be individualised based on type, dose and pattern of drug use, and previous glucose monitoring. Information from continuous glucose monitoring devices during 'rave' parties may further the understanding of glycaemic excursions with drug use in real-life circumstances. In the meantime, such causes of poor glycaemic control remain covert.

Our survey is the largest published report of recreational drug use in T1D. Only four other studies have examined the pattern of drug use in young people with T1D, predominantly using structured questionnaires with target populations of 80–193 subjects from diabetes camps or tertiary clinics.[13–16] Our study extended invitation nationally to all young people with T1D, capturing over 500 respondents, in contrast to previous cross-sectional studies involving subjects from a limited clinical setting.

The current study does not include all young people with T1D, and the response rate is unknown. Therefore, the true prevalence of drug use in T1D cannot be ascertained. Regardless of the true prevalence, given its adverse effects of drugs on glycaemia, drug use is associated with clinically significant deterioration in diabetes control. Given only 7% of positive respondents to the survey had informed their health professionals about drug use, a similar screening questionnaire may be incorporated into routine care in diabetes clinics. A similar screening questionnaire may be incorporated into routine care in diabetes clinics. It may reduce the anxiety arising from direct disclosure during a consultation and encourage self-reporting, similar to that observed in the current study.

Our survey indicated that drug use is currently underreported and poorly managed even in modern multidisciplinary diabetes centres. It appears a significant, but currently hidden, contributor to poor glycaemic control and adverse health outcomes in young adults with T1D. With heightened awareness and increased acceptance that poly-drug use occurs, medical personnel should be able to elicit a drug history from patients in a non-judgmental way. Adjustments in therapy could reduce the accompanying metabolic risks.

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New HIV diagnosis after occupational exposure screening: the importance of reporting needlestick injuries

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Abstract

We describe three new diagnosis of HIV infection as a direct result of testing following occupational exposures (NSIs) in a low-prevalence setting. In each case the finding was unexpected. Our series provides a reminder of the importance of prompt reporting of NSIs by healthcare workers, access to rapid HIV testing and post-exposure prophylaxis with antiretrovirals to prevent transmission.

Human immunodeficiency virus (HIV) infection is most often diagnosed as part of the investigation of a suspicious clinical illness or as part of a regular testing programme in a patient either with known risk factors such as men-who-have-sex-with-men, injecting drug users or in settings where testing is routine, such as antenatal screening, for immigration or insurance purposes.

We describe three cases of new diagnosis of HIV infection in a 5-year period between 2003 and 2008 as a direct result of testing following occupational needlestick injuries (NSIs) in a low-prevalence setting. In each case the finding was unexpected and our series provides a reminder of the importance of prompt reporting of NSIs by healthcare workers (HCWs) and access to