The South Australian Emergency Department Admission Blood Psychoactive Testing (EDABPT) program: first results

Sam Alfred[1,2], Peter Stockham[3,4], Emma Partridge[3,4], Alastair Ward[2], Hannah Green[5], Jake Mallon[6], Chris Kostakis[3], Andrew Camilleri[3], Daniel Haustead[1,2]

Illicit drug use and its associated harms are growing public health problems. In Australia, it is involved in 6.9% of emergency department (ED) presentations[1] and unintentional drug-related death is a growing cause of death among young people.[2] Nevertheless, toxicological testing is rarely performed during illicit drug-related ED presentations, and information about the patterns of illicit drug use associated with such presentations is limited to statements by patients and clinicians' interpretations of their clinical features.

To explore which drugs are involved in ED presentations, we obtained de-identified clinical information and blood samples for people who presented to the four major EDs in Adelaide (Royal Adelaide Hospital, Lyell McEwin Hospital, the Queen Elizabeth Hospital, Flinders Medical Centre) with presumed illicit drug intoxication and required intravenous access or blood testing as part of routine care. Blood samples underwent comprehensive forensic testing for more than 500 compounds according to our published protocol.[3] The Central Adelaide Local Health Network Ethics Committee approved the study and waived the requirement for individual participant consent (HREC/17/RAH/439 R20171015).

A total of 1120 cases during 1 March 2019 – 31 May 2020 were evaluated; the median age of the patients was 31 years (interquartile range, 24–41 years; range, 18–68 years), and 718 were men (64%). We detected 120 unique drugs; no substance was detected in 39 cases (3.5%). Most drug use was undertaken at home or in public spaces, not in licensed venues or at ticketed events (Box). Most people (818, 73%) were managed in and discharged from the ED or their associated short-stay units; 190 people required intensive care (17%), and 101 other inpatient services (9%).

More than one drug (other those probably administered during treatment) was detected in blood from 784 people (70%; mean number detected, 2.5; standard deviation, 1.5; range, 0–9), with unpredictable clinical effects. The most frequently identified drug was methamphetamine (611 patients, 54.6%); 713 people (63.7%) were clinically sedated during their presentation, including 403 of those positive for methamphetamine (66.0%). Methamphetamine levels were correlated with neither sedation nor agitation, which suggests that clinical assessment cannot reliably identify the substances taken.

γ-Hydroxybutyrate (GHB) was detected in 309 samples (27.6%). Methamphetamine was detected in 256 samples positive for GHB (82.8%) and 353 negative for GHB (43.5%); 228 people positive for both methamphetamine and GHB (89%) had presented with sedation.

The numbers of samples positive for diazepam (215, 19.2%), pregabalin (102, 9.1%), and opiate agonists (149, 13.3%) are concerning. Pregabalin was detected in larger proportions of opiate-positive (48, 32%) and benzodiazepine-positive samples (66, 20%) than overall, supporting concerns about pregabalin being used together with these drugs in Australia.[4] Several "designer" benzodiazepines (eg, etizolam, flualprazolam, flubromazolam) were detected, particularly towards the end of the study; recent concerns about these novel psychoactive substances have been noted by the United Nations Office on Drugs and Crime.[5]

Our study provides information about drug use patterns associated with ED presentations with illicit drug intoxication

Characteristics of drug use detected in blood samples from 1120 people who presented with presumed illicit drug intoxication to the four major metropolitan emergency departments in South Australia, 1 March 2019 – 31 May 2020

Characteristic	Number
Gender	
Men	718 (64.1%)
Women	374 (33.4%)
Unknown	28 (2.5%)
Setting	
Private home	466 (41.6%)
Public space (park/street)	265 (23.7%)
Private social event/party	62 (5.5%)
Ticketed event	22 (2.0%)
Licensed venue	59 (5.3%)
Other	103 (9.2%)
Unknown	142 (12.8%)
Drug detected (parent drug only)	
Methamphetamine	611 (54.6%)
Alcohol	338 (30.2%)
Samples containing one or more benzodiazepines	332 (29.6%)
Diazepam	215 (19.2%)
One or more novel psychoactive substance benzodiazepines	34 (3.0%)
γ-Hydroxybutyrate (GHB)	309 (27.6%)
Opiates/opioids	149 (13.3%)
3,4-Methylenedioxymethamphetamine (MDMA)	108 (9.6%)
Pregabalin	102 (9.1%)

* One or more of morphine, heroin, methadone, tramadol, oxycodone, tapentadol.

[1]The University of Adelaide, Adelaide, SA. [2]Royal Adelaide Hospital, Adelaide, SA. [3]Forensic Science SA, Adelaide, SA. [4]Flinders University, Adelaide, SA. [5]Lyell McEwin Hospital, Adelaide, SA. [6]Flinders Medical Centre, Adelaide, SA. sam.alfred@sa.gov.au • doi: 10.5694/mja2.51907

in South Australia. It suggests that most people presenting to hospital have taken a mixture of agents, and that the combination of GHB with methamphetamine is particularly frequent.

Acknowledgements: This project is supported in part by the National Centre for Clinical Research on Emerging Drugs, funded by the Australian Department of Health.

Open access: Open access publishing facilitated by The University of Adelaide, as part of the Wiley - The University of Adelaide agreement via the Council of Australian University Librarians.

Competing interests: No relevant disclosures. ■

Received 9 August 2022, accepted 9 March 2023.

1 Dawson J, Remke S, Fatovich D. Snapshot audit of illicit drug-related presentations. *Emerg Med Australas* 2020; 32: 530-532.

2 Man N, Chrzanowska A, Dobbins T, et al. Trends in drug-induced deaths in Australia, 1997–2018 [Drug Trends Bulletin Series, National Drug and Alcohol Research Centre, UNSW Sydney]. Updated 21 July 2021. https://ndarc.med.unsw.edu.au/resource-analytics/trends-drug-induced-deaths-australia-1997-2019 (viewed July 2022).

3 Partridge E, Alfred S, Camilleri A, et al. Establishing the protocols for the South Australian Emergency Department Admission Blood Psychoactive Testing (EDABPT) programme for drug surveillance. *Emerg Med Australas* 2021; 33: 883-887.

4 Crossin R, Scott D, Arunogiri S, et al. Pregabalin misuse-related ambulance attendances in Victoria, 2012–2017: characteristics of patients and attendances. *Med J Aust* 2019; 210: 75-79. https://www.mja.com.au/journal/2019/210/2/pregabalin-misuse-related-ambulance-attendances-victoria-2012-2017

5 United Nations Office on Drugs and Crime. Current NPS threats, volume IV. Nov 2021. https://www.unodc.org/documents/scientific/NPS_threats_IV_web.pdf (viewed June 2022). ■