

# A bolt out of the blue: the night of the blue pills

*Public warnings about clusters of cases ... should be issued on the basis of clinical presentations rather than of definitive analyses*

**David S McCutcheon**  
MBBS, FACEM<sup>1</sup>

**Francois J Oosthuizen**  
BSc(Hons), MSc, PhD<sup>2</sup>

**Kerry A Hoggett**  
MBBS, GCertClinTox, FACEM<sup>1,3</sup>

**Daniel M Fatovich**  
MBBS, FACEM, PhD<sup>4</sup>

<sup>1</sup> Royal Perth Hospital,  
Perth, WA.

<sup>2</sup> ChemCentre,  
Perth, WA.

<sup>3</sup> NSW Poisons Information  
Centre, The Children's  
Hospital at Westmead,  
Sydney, NSW.

<sup>4</sup> University of  
Western Australia,  
Perth, WA.

david.mccutcheon@  
health.wa.gov.au

doi: 10.5694/mja14.01317

## Clinical record

A cluster of 10 patients presented during the night of 31 December 2013 to the emergency department of Royal Perth Hospital with states of agitated delirium or exhibiting unusual behaviour. Eight of the patients had attended an open-air dance party in the city close to the hospital, and nine had arrived by ambulance. All except one admitted to taking non-prescription drugs in tablet form, most believing they were consuming ecstasy (3,4-methylenedioxymethamphetamine, MDMA) in the form of blue or grey pills, in several cases imprinted with a lightning bolt. Media warnings had already been issued in response to similar cases involving acute psychosis reported by another metropolitan emergency department (Fremantle Hospital).<sup>1,2</sup>

The median age of the patients in our cluster was 20 years (interquartile range [IQR], 18–22 years). The median initial heart rate was 115 beats per minute (IQR, 84–155 beats per minute). Four patients were febrile (temperature  $\geq 37^{\circ}\text{C}$ ) but only one had a temperature greater than  $38^{\circ}\text{C}$ . All patients had dilated pupils (median width, 6 mm [IQR, 5–7 mm]). Five patients required intravenous sedation, and in two cases more than 50 mg diazepam was required.

The patients had posed a significant risk to themselves before attending the emergency department: one had been found collapsed on the dance floor, another had wandered through vehicular traffic, and a third had fallen after climbing an 11 metre-high lighting rig.

The clinical syndrome included a state of agitated delirium, with labile mood, tachycardia, dilated pupils, sweating and, in several patients, involuntary movements. Clonus was present in only one case. One patient tried several times to hit staff members, while another spat at them. The most severely affected patient developed status epilepticus, and required intubation and admission to the intensive care unit. After recovery, he stated it was only the second time he had used non-prescription drugs.

The cluster of patients had a significant impact on emergency

department resources. They comprised 10 of the 83 patients who presented to the department in the 7-hour period between 19:55 and 02:55. Many required intensive nursing care and intravenous sedation. One patient flipped over the safety railing of his trolley and landed on his head, but was not significantly injured. The median hospital length of stay was 5.4 hours (IQR, 3.0–11.9 hours).

Emergency treatment of the patients followed standard procedures for a sympathomimetic syndrome,<sup>3</sup> and included oral or intravenous administration of benzodiazepines and fluids, observation and, in one case, intubation and cooling for status epilepticus. In patients for whom benzodiazepines were indicated, unusually large doses were needed to achieve adequate sedation.

Blood samples were taken from nine of the patients when intravenous cannulae were inserted as part of routine clinical care. Retrospective analysis of stored plasma samples using liquid chromatography–mass spectrometry was undertaken 40 days later by ChemCentre forensic laboratories (Perth, WA) to attempt to identify the substances responsible for the patients' symptoms. Results were compared with a large library of conventional and novel recreational drugs.

No novel synthetic agents were identified, but methamphetamine was detected in samples from two patients. The clinical syndrome observed and the absence of evidence for conventional drugs of misuse in all but two of the samples aroused suspicions of unidentified synthetic drugs. As analysis of drugs recently seized by police indicated that many "ecstasy tablets" contained high amounts of caffeine, caffeine levels were assessed in our samples, but were found to be uniformly low. Most of the tablets taken by the patients had been marketed as ecstasy, but no MDMA was detected in any of the plasma samples. Interestingly, lactate levels were elevated in all patients (median concentration, 3.1 mmol/L; IQR, 2.5–3.8 mmol/L), and all samples but one contained high levels of ethanol (median concentration, 180 mg/100 mL; IQR, 140–220 mg/100 mL).

## Discussion

The continued emergence of novel synthetic recreational drugs is a growing problem in many countries, and the short- and long-term effects of these compounds are poorly understood. There have been recent deaths in Australia linked with such substances.<sup>4</sup> Little reliable information is readily available to inform either users or clinicians.

There are several possible technical reasons why new synthetic drugs were not detected in our patients' plasma samples. These could include adsorption of the drug by gel in the collecting tube<sup>5</sup> and instability of the drug at room temperature or when refrigerated at  $4^{\circ}\text{C}$ .<sup>6-7</sup> These problems may have been compounded by the 40-day delay between collection and analysis.

Ongoing research into new synthetic drugs is needed to identify which harmful substances are currently circulating in the community and to inform potential users of their harms. Public warnings about clusters of cases, if deemed appropriate, should be issued on the basis of clinical presentations rather than of definitive analyses, given the time delay involved in performing these. The optimal treatment of patients is unknown and will vary according to the compound ingested. Future research should also consider the most appropriate methods for collecting samples to optimise analysis outcomes, including the temperature at which samples should be stored to preserve the chemicals of interest.

## Lessons from practice

- The use of novel synthetic drugs is an increasing problem.
- There is little reliable information to inform users or clinicians about these drugs.
- The optimal use of the media to warn potential users is yet to be defined.
- Future storage and analysis of substances should take into account their potential instability and low plasma concentrations.

Public health warnings about a dangerous batch of "ecstasy" tablets had been issued to the media earlier in the day on which our patients had taken their pills,<sup>1,2</sup> but the effectiveness of these messages is unknown. Most of our patients erroneously thought they had taken MDMA, and all had consumed only a small number of tablets. Media reports often mention the dangers of an "overdose", implying the consumption of many tablets, which could mislead users into believing that one or two tablets (of an unknown substance) are safe. Public health messages should consider the need to communicate risk effectively, but there may also be unintended adverse consequences. These include encouraging experimentation by alerting naive or non-consumers to potential new drugs.

**Competing interests:** No relevant disclosures. ■

References are available online at [www.mja.com.au](http://www.mja.com.au).

- 1 Concern about spike in drug psychosis cases presenting to hospital. *ABC News* [website] 2013; 31 Dec. <http://www.abc.net.au/news/2013-12-31/concern-about-spike-in-drug-psychosis-cases/5180198> (accessed Jul 2014).
- 2 Boddy N. Psychosis link to party drug. *The West Australian* (Perth) 2013; 31 Dec. <https://au.news.yahoo.com/a/20546307> (accessed Jul 2014).
- 3 Chan TC, Evans SD, Clark RF. Drug-induced hyperthermia. *Crit Care Clin* 1997; 13: 785-808.
- 4 Callinan R. Synthetic drugs: rising death toll alarms authorities. *Sydney Morning Herald* 2014; 11 Jan. <http://www.smh.com.au/national/synthetic-drugs-rising-death-toll-alarms-authorities-20140110-30mhw.html> (accessed Jul 2014).
- 5 Sanford KW, McPherson RA. Preanalysis. In: McPherson RA, Pincus MR, editors. *Henry's clinical diagnosis and management by laboratory methods*. 22nd ed. Philadelphia, Pa: Elsevier, 2011: 24-36.
- 6 Johnson RD, Botch-Jones SR. The stability of four designer drugs: MDPV, mephedrone, BZP and TFMPP in three biological matrices under various storage conditions. *J Anal Toxicol* 2013; 37: 51-55.
- 7 Soh YA, Elliott S. An investigation of the stability of emerging new psychoactive substances. *Drug Test Anal* 2013; 6: 696-704. ■