Other full case

Energy-1 ('NRG-1'): don't believe what the newspapers say about it being legal

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Summary

A 31-year-old man purchased the legal high Energy-1 (NRG-1) over the internet; this was advertised as containing the compound naphthylpyrovalerone (NPV), which at the time was currently legally available in the UK. He ingested 1 g of this substance and developed a prolonged high associated with palpitations, sweating and insomnia. Analysis of both the powder and serum samples from the patient demonstrated that he ingested two classified recreational drugs β -keto-*N*-methylbenzodioxolylpropylamine (butylone) and methylenedioxypyrovalerone (MDPV) rather than the legal substance NPV. Users of legal highs need to be aware that legal highs purchased over the internet may contain illegal substances and therefore they may be liable for prosecution if found in possession of these substances. Future educational campaigns aimed at recreational drug and legal high users should include reference to the potential legal implications of buying these substances.

BACKGROUND

The use of 'legal highs' is common and in a recent survey of over 2000 clubbers in the UK, 59% had previously used some form of legal high and 38% had previously used a legal high pill.¹ There is the potential for significant acute toxicity associated with the use of legal highs, similar to the toxicity seen with classical stimulant recreational drugs such as 3,4-methylenedioxymethamphetamine (MDMA), amphetamine and cocaine.²

Compounds previously detected in legal highs have included the piperazines (eg, 1-benzylpiperazine), the synthetic cannabinoid receptor agonists (commonly known as 'spice') and the cathinones (eg, mephedrone). As evidence is gained that novel compounds detected in legal highs have similar desired effects as classical controlled recreational drugs and that their toxicity is similar, consideration to their legal status is undertaken. This is undertaken by the Advisory Council on the Misuse of Drugs at a UK level and the European Monitoring Centre for Drugs and Drug Addiction at a European level. As a result of these considerations, a number of piperazines, the synthetic cannabinoid receptor agonists and the synthetic cathinones have been controlled under the UK Misuse of Drugs Act (1971).^{3–5}

The products available to consumers from internet suppliers is continually evolving, and they appear to be marketing products containing 'novel compounds' that remain outside the UK legislation. However, previous studies have shown that products sold to individuals as containing legal compounds may in fact contain substances that have been controlled.⁶ We report here a case of acute toxicity associated with the use of a supposed 'legal' product that in fact

on detailed toxicological screening contained a combination of controlled substances.

CASE PRESENTATION

In late April 2010, a 31-year-old man, with no significant medical or family history, presented to an inner-city London Emergency Department (ED) following use of a 'legal high'. He had read an article in *The Times* newspaper that was published after the cathinone group of recreational drugs were classified under the UK Misuse of Drugs Act (1971) on 16 April 2010. This article discussed novel 'legal highs' available since the change in the UK law and in particular 'naphyrone' (naphthylpyrovalerone (NPV)). After reading this article, he researched legal high suppliers on the internet to look for a company that would dispatch an order of naphyrone.

He received a bag of powder labelled 'Energy-1 Research Compound HARMFUL!' (figure 1) that was advertised on the website as containing NPV. He mixed approximately 1 g of this powder with wine and ingested this mixture. He noted at the time of ingestion that it tasted 'nasty'. Shortly after ingestion, he developed an 'intense high' similar to the high experienced in the past with MDMA (ecstasy) use and he noticed that his heart was racing. This high lasted for several hours and he felt that it was much more prolonged than those he had experienced in association with other recreational drugs that he had taken previously. In addition, he developed prolonged insomnia, sweating, abdominal discomfort and 'fluctuating body temperature'.

He presented to the ED approximately 30 h post-ingestion, with ongoing difficulty in sleeping, anxiety and

Figure 1 Picture of the Energy-1 purchased by the patient; the packet is clearly marked as 'harmful' and 'research chemical'.

agitation. On arrival in the ED, he was clinically well with a normal heart rate (75 beats per minute), blood pressure (153/86 mm Hg) and temperature (36.4°C). The only features of sympathomimetic toxicity present on clinical review at the time of presentation to the ED were dilated pupils (5 mm) and agitation/anxiety.

INVESTIGATIONS

Toxicological analysis performed on the Energy-1 purchased by the patient by infrared spectrophotometry and gas chromatography with mass spectrometric detection showed that it contained β -keto-*N*-methylbenzodioxolylpropylamine (butylone) and MDPV. Both of these compounds were controlled as Class B substances under the 16 April 2010

modification of the UK Misuse of Drugs Act (1971).⁴ Both butylone and MDPV were also detected in a serum sample taken from the patient that was analysed by liquid chromatography mass spectrometry-mass spectrometry.

TREATMENT

He was offered a single dose of oral lorazepam, which he declined, and was reassured that his anxiety/agitation would settle.

OUTCOME AND FOLLOW-UP

After 4 h of observation, he was asymptomatic and discharged home with advice on the avoidance of using recreational drugs, including legal highs.

DISCUSSION

This patient purchased what he thought was a legal high that contained NPV, a substituted cathinone that was not covered under the generic cathinone amendment to the UK Misuse of Drugs Act (1971) that was passed on 16 April 2010 and therefore at the time of purchase was legal in the UK. The product in fact contained a mixture of two classified compounds, butylone and MDPV. This is the first report of acute toxicity associated with the use of these compounds.

A recent study on the analysis of multiple 'NRG-1' products purchased from the internet also reported MDPV and butylone in this legal high rather than the marketed NPV.⁷ In addition, previous studies have shown that the constituents of legal highs purchased over the internet do not remain constant.⁶

This variation in active contents of legal high products can have both legal and clinical implications. Under the UK law, if an individual purchases compounds over the internet that instead of containing 'legal' compounds actually contain ingredients that are controlled, they would be subject to prosecution if found in possession of the compound. From a clinical perspective, there is also the potential for an increased risk of acute toxicity related to the variation in contents of legal highs due to the likely difference in the relative potencies of different stimulant recreational drugs such as the cathinones and pyrovalerones.

Current information disseminated to users of recreational drugs and legal highs focuses on the potential for acute and chronic harm associated with their use. Despite this, individuals may presume that because these products are legally available there are minimal risks associated with their use. We suggest that future educational and primary/secondary prevention material for recreational drug users not only includes information on the potential for acute/chronic harm associated with the use of these substances, but also discusses the potential that users may be buying and using substances that are in fact illegal. It is possible that this may be more effective in decreasing the use of these substances because it is likely that the users of 'legal highs' do not wish to put themselves at risk of arrest, criminal conviction and the associated consequences in terms

Learning points

- Legal highs marketed to consumers as containing products not controlled by UK legislation may in fact contain controlled substances.
- Possession of products that contain controlled substances puts an individual at risk of arrest and subsequent prosecution, even if the individual purchased the product in the belief that it contained only 'legal' compounds.
- Strategies to reduce the use of legal highs should not only focus on the harms associated with the use of legal highs, but also inform individuals about the potential inadvertent legal consequences of purchasing these products.

of work, family and travel for using controlled recreational drugs.

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Patient consent Obtained.

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