Editorial

Mephedrone and 'head/hemp' shop drugs: a clinical and biochemical 'heads up'

Seán Ó Domhnaill, Caoimhe Ni Chleirigh

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Reports of attacks in 2010 by persons unknown upon the so-called 'head' shops in Dublin and other cities and towns, combined with open picketing of such shops nationwide amid intense media reportage, support the clinical experience of increased presentation of the drugs known as 'Head/hemp shop' drugs in the medical domain nationwide. Case reports relating to the psychiatric sequelae of the consumption of these drugs are currently in preparation (personal correspondence). It is important that primary care physicians, the emergency services and psychiatric specialists realise that they need to consider these drugs in the presentation of new cases with drug-induced psychoses and/or acute suicidal dysphoria. While these drugs are now detectable using tests for their presence/absence, the reagents and equipment for recognising these drugs is only present in specialist treatment centres for drug abuse. They must be considered in the differential diagnosis of the atypical clinical syndromes presenting to general hospital emergency departments and psychiatric unit assessment units in the future using the experience of their presentation over the past 18 months.

Background

In the past 18 months, there have been increasing reports of people with drug-induced psychosis and morbid intoxication presenting at hospitals nationwide.[1] Emergency department reports and psychiatric unit admissions indicate that many of these presentations are associated with the use of so-called 'head shop' drugs, which are taken by nasal inhalation, smoking or oral ingestion. Additional reports from the treatment services for addiction in the UK[2] suggest that the phenomenon is not confined to Ireland. There have been reports from other countries[3] of fatal sequelae from the use of 3,4-methylmethcathinone, the most frequently encountered of these drugs but other substances such as BZP (benzylpiperazine), Metylone and Salvia have also been made widely available through the so-called 'head shops'.

Since May 14, 2010, these drugs have been added to the list of controlled substances in the Republic of Ireland, whereas before this they were being openly sold with impunity.[4] Attacks on retail outlets providing these drugs have also been accompanied by serious attacks upon the suppliers' properties, included arson and, in one case, a grenade-attack on the home of the shop-owner. No injuries have yet been reported in this regard. The discovery of €0.5 million in one of these shops after its destruction by fire[4] indicates the level of profit being accumulated, with an observable drop in the price of related illicit drugs, cocaine to €10 per bag, MDMA to €3-5 per pill, accompanying the increased availability of the 'purer' pretenders to the psychostimulant and hallucinatory drugs' crown.

Doctors need to be aware of the proliferation of these drugs and to consider them in their differential diagnosis of psychosis presenting in those with no known history of previous substance misuse, as well as in those with dual diagnosis of psychotic disorder since comorbid illicit substance-use in present in approximately 30% of those with severe and enduring mental illness.[5]

Biochemistry of new agents

The most frequently encountered of these new substances are mephedrone, salvia, benzylpiperazine (BZP) and their derivatives. 3,4-Methylmethcathinone, a methyl derivative of cathinone, derived from the "Khat" plant, *catha edulis*, is also known as mephedrone and can be relatively easily produced from pseudoephedrine.[6] It appears to be the most frequently encountered in the drugs which were being sold as 'legal highs' in the retail outlets mentioned earlier. This substance, mephedrone, and related compounds mephedone, methedrone, methlyone and others (not to be mistaken with methadone the prescribed opiate substitute) are derivatives of methcathinone and are therefore in the cathinone group. They are structurally similar to the phenethylamines, the group of compounds which includes MDMA. Each of the phenethylamines has a structural analogue in the cathinone group, ketone structures which were not proscribed by law in western Europe until recent times.

Known colloquially as M, Miaow, Miu, M-Cat and a variety of other street names, the mephedrone-based products induce an empathogenic euphoric effect similar to that of MDMA and a psychostimulant effect similar to cocaine hydrochloride. Their clinical effects appear to last approximately two to three hours when taken orally in their powder or tablet forms,[7] with early reports of dependence syndromes similar to that of psychostimulants.[8] Salvia is a herbal drug derived from the plant *salvia divinorum* (the Diviner's sage) previously sold as a legal alternative to cannabis. It is associated with intense paranoid and other psychotomimetic symptomatology. Case reports examined by the author, in addition to direct clinical experience, confirm the serious nature of the presenting symptomatology and its association with severely distressing psychiatric symptoms. The so-called 'legal highs' are almost invariably initially consumed with alcohol, and frequently lead

***Seán Ó Domhnaill,** MB, DPM, MRCPsych, Dip. Cog. Therapy, Consultant Psychiatrist, St. Loman's Hospital, Mullingar, Co. Westmeath. Medical Director, Cuan Mhuire Teoranta, Addiction Treatment Services, Ireland. Email: seanc.odomhnaill@hse.ie
Caoimhe Ni Chleirigh, Senior House Officer, Dublin University Psychiatric Training Rotation, Jonathan Swift Clinic, St. James Hospital, Dublin 8, Ireland.
**Correspondence*

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Table 1: Clinically observable effects of mephedrone and other 'legal highs'

Euphoria/Elation	Drowsiness	Over-talkative	Dilated pupils	Tachycardia
Hypertension	Excess sweating	Nystagmus	Dizziness	Muscle twitching
Trismus	Bruxia	Vertigo	Nasopharyngeal swelling	Sinusitis
Agitation/marked anxiety/ Panic	Restlessness and inability to settle	Formication or in tense pruritus	Intoxication or confusion	Disinhibition

to the clinical syndrome illustrated in *Figure 1*. The use of salvia is more frequent in regular users of cannabis who hear of its more potent anxiolytic effect, and are rarely advised of its pathogenic potential until after they have experienced a 'bad trip'.

Clinical effects

Like all these agents, their low-dose use is generally associated with relatively benign social effects while their use at higher doses, or in conjunction with alcohol-use can be associated with disinhibition and subsequent provoked/ unprovoked violence. Negative effects appear to be dose-related[10] and include intense desire to re-dose, uncomfortable body temperature (sweating and chills), palpitations, insomnia, impaired short-term memory, uncomfortable jaw-clenching and grinding of teeth (trismus and bruxia) and light-headedness. These effects can be multiplied, and are often dose-dependent, leading in many cases to admission to Intensive Therapy Units in general hospitals because of their severe, but usually short-lived, clinical impact.[9] Cathinones, the parent compounds for many of these drugs, are now listed in an amendment to the Misuse of Drugs Act 1977, enacted in May 2010 and, as a result, their legal provision has been stopped at present.

There has been little scientific examination of mephedrone, and unfortunately much of the available information has come from personal clinical and internet reports. Clinical experience and user-related dialogue indicate that the so-called legal highs have been diverted to street sale, with new variations also appearing.[10] The Criminal Law (Psychoactive Substances) Act 2010 has amended the 1977 Act with good effectiveness observable over seven months later. Future publications in Ireland and neighbouring European countries will no doubt provide the additional information needed to identify and treat those suffering from psychiatric and physical syndromes associated with use of these extremely potent synthetic psychoactive agents.

Garda reports indicate that these drugs were being encountered in intoxicated persons but, because of the initial absence of an identifying apparatus, subsequent prosecution under the Public Order Act 1994 was proving impossible, apart from under Section 6 dealing with the use of "threatening and abusive behaviour".[11] While bearing a strong clinical similarity with proscribed drugs, they were not detectable in basic toxicology screening using most commonly-available drug identification kits, but must be suspected when encountered in clinical syndromes associated with drug-use. The presence of other illicit or unprescribed prescription drugs should raise suspicions. Subsequent brief interventions should be to maintain homeostatic mechanisms and to treat any psychotic syndromes encountered. 'Head shop' use has been associated with fatalities; including the first death in the Republic of Ireland.[6,7] Little reliable information is available for the interaction of the new agents with other drugs.

Concerns for the future

Primary concerns for the future should be that these drugs require a reliable and widely available detection system, the continuing relevant legal regulation of their availability, a greater clinical knowledge of their effects and the most appropriate treatment. Current medical treatment is supportive. Current psychiatric treatment is along the lines of psychostimulant psychosis treatment and appears to be appropriate. Longer-term treatments will follow the more traditional lines of harm minimisation, abstinence programmes, CBT and medical treatment of dependence syndromes. With the number of drug-misusers increasing annually in this country, it is important that we do not allow yet another drug of abuse, particularly the no longer 'legal highs' to become widespread in their use in addition to the most harmful of the 'legal highs', alcohol.

Declaration of Interest: None.

References

1. National Documentation Centre report. January/February 2010. Heath Research Board.
2. Sumnall & Wooding. Briefing Document. Centre for Public Health, Liverpool John Moore's University. December 2009.
3. http://www.setox.org/Archivos/Noticias/Mephedrone.pdf Psyconaut Web Mapping Service. Campbell 2009.
4. Gartland, Fiona. Irish Times. February 19th, 2010.
5. Drake, D.E., Mueller, K.T., Brunette, M.F. and McHugo, G.J., (2004). " A review of treatments for clients with severe mental illness and co-occurring substance use disorder.". Psychiatric Rehabilitation Disorder, 27, 360-374.
6. "Methcathinone: a new post-industrial drug". Belhadj-Tahar H, Sadeg N. Forensic Science International 2005. Oct 4;153(1):99-101.
7. Legal highs contributed to death of woman (19). Irish Times, June 22, 2010..
8. Sumnall & Wooding. Briefing Document. Centre for Public Health. Liverpool John Moore's University. December 2009.
9. Mephedrone. www.psychonautproject.eu
10. It's time for the head shops to go. Ó Domhnaill, S & O'Callaghan, M. Irish Medical News. April 6th 2010.
11. Personal contact with Garda Drug Identification Service, Garda Forensic Laboratory, Phoenix Park, Dublin.