

International Conference on SPICE Prevention Issues

Conference Handout

First International Conference on Toxicity, Risk Profiles,
Legal Control and Prevalence of Synthetic Cannabinoids

25-26 September 2012, Frankfurt am Main



Introduction

Welcome to the Conference on SPICE Prevention Issues 2012. We are delighted to share the results of the research on toxicity and prevalence of synthetic cannabinoids collected in the context of the EU-project “SPICE and synthetic cannabinoids”, which is funded by the European Commission, the Federal Ministry of Health and the City of Frankfurt. The conference gives the opportunity to learn more about the phenomenon of Spice Products and to discuss prevention approaches applicable to new psychoactive substances.

Around 2004, a ‘herbal incense’ product sold under the brand name ‘Spice’ appeared in Europe. Herbal incense or herbal smoking mixtures were gaining a high degree of popularity by mid-2008. In December 2008, German labs identified synthetic cannabinoids in these products. Synthetic cannabinoids (or, more precisely, cannabinomimetics) are psychoactive substances that mimic the effects of Δ 9-tetrahydrocannabinol (THC), the main active compound in cannabis / marijuana. They bind to the same cannabinoid receptors in the brain as THC. However, many of the synthetic cannabinoids are much more potent than THC.

Usually the synthetic cannabinoids are sprayed on the plant material. The herbal mixtures are sold in small bags with a brand name on it, often labelled “not for human consumption”. The active compounds are not declared as ingredients on the packaging. Since Spice products are mostly sold and discussed on the Internet, they are often regarded as “largely an Internet phenomenon” (EMCDDA 2009) and therefore “(m)onitoring the Internet is becoming essential to identify and understanding new trends” (Deluca 2012).

Most of the respective cannabinoids were first synthesised in the context of pharmaceutical research projects carried out in the 80’s and 90’s. They had never shown up in any commercially available product before and no human studies with these cannabinoids have been carried out (EMCDDA 2009). The JWH series, created by the chemist John W. Huffman at Clemson University, is the most common family of synthetic cannabinoids (e.g., JWH-018, JWH-073, and JWH-210). Other names of cannabinomimetics include HU-210, AM-694 or CP 47,497. There are hundreds of synthetic cannabinoids that may function as active compounds of herbal mixtures (Rosenbaum et al. 2012).

The constant change substances used by manufacturers and traders makes it difficult to assess, monitor and control the supply of these products. Furthermore, prevention and treatment agencies face new problems associated with the use of herbal mixtures and other “legal high” products (see, e.g., NACD 2011).

There is a strong need of organisations active in prevention work for scientific facts and arguments when discussing the risks associated with the use of new psychoactive substances with drug users. For health care providers it is important to be familiar with symptoms of intoxication and other side-effects. Therefore it is necessary to supply substantial science-based information on toxicity and risk profiles.

So far, there have been few reports on clinical effects in humans of herbal mixtures or synthetic cannabinoids (Forrester et al. 2012). The knowledge on the toxicity of these substances is limited, but “indeed there are some reasons for concerns that these drugs may have a greater potential to cause harm” (EMCDDA 2009). These assumptions largely derive from the fact that many cannabinomimetics work as full agonists to the human cannabinoid receptors, while THC shows only partial agonist affinity. There are speculations that some synthetic cannabinoids may have a carcinogenic potential. Furthermore, some of these substances might have a relatively high potential to cause dependence and intoxications because of the unknown ingredients as well as the varying amounts and potencies of added drugs.

International Conference on SPICE prevention issues

Programme

Tuesday 25 September

12:30 *Registration*

Chair: Albert Kern, Federal Ministry of Health, Germany

13:15 **Welcome and opening remarks**

PD Dr. Volker Auwärter (University Medical Center Freiburg)
Ms. Judith Bugreev (Office of the Drug Commissioner of the Federal Government)
Ms. Rosemarie Heilig (Councillor for Environment and Health, City of Frankfurt)
Michael Evans-Brown (EMCDDA)

Presentation of the results of the SPICE project

Plenary session

14:00 PD Dr. Volker Auwärter, University Medical Center Freiburg
Analytical and clinical experiences - from product monitoring to drug testing

14:15 Prof. Dr. Siegfried Knasmüller, Medical University Vienna
Assessment of toxicological properties and establishment of risk profiles
Dr. Verena Koller, Medical University Vienna
Genotoxic properties of selected spice compounds

14:30 Prof. Dr. Ilkka Ojanperä, University of Helsinki
Detection of synthetic cannabinoids in human specimens
Teemu Gunnar, National Institute for Health and Welfare, Helsinki
Prevalence of SPICE products in Finland

14:45 Prof. Dr. Bela Szabo, Albert-Ludwigs-University Freiburg
Effects of synthetic cannabinoids, identified in smoking herbal products, on synaptic transmission in the brain

15:00 Dr. Werner Bernhard /Prof. Dr. Wolfgang Weinmann, University of Bern
Measures in Switzerland in the fight against new drugs such as "SPICE" products and "bath salts"

15:15 *Discussion*

15:30-16:00 *Break*

16:00 Michael Pütz, Federal Criminal Police Office, Germany
"Legal" Highs in the legal system

16:15 Dr. Bernd Werse, Centre for Drug Research, University of Frankfurt
Social research on synthetic cannabinoids: A synopsis of the available data

16:30 Michal Kidawa, National Bureau for Drug Prevention, Poland
Legal Highs in Poland

16:45 *Discussion*

17:00 **Concluding remarks**

International Conference on SPICE prevention issues

Programme

Wednesday 26 September

Chair: Albert Kern, Federal Ministry of Health, Germany

Legal Highs: New challenge for traditional prevention approaches?!

Plenary session

9:15 Stefanie Helmer, Institute for Epidemiology and Prevention Research GmbH (BIPS), Bremen
Findings of a German subsample of a European 'social norms' intervention study.

9:30 Renate Lind-Krämer, Drug Coordination Department of the City of Frankfurt am Main /
Karsten Tögel-Lins, basis e.V.
Keynote speech on prevention advice

10:00 Alexander Bücheli, City of Zurich, Departement of Social Affairs, Addiction and Drugs,
«Streetwork» Youth Advisory Service
Keynote speech on prevention advice

10:15-10:30 *Break*

Panel discussion

10:30 Renate Lind-Krämer, Drug Coordination Department, City of Frankfurt, Germany
Alexander Bücheli, City of Zurich, Departement of Social Affairs, Addiction and Drugs,
«Streetwork» Youth Advisory Service
John Arthur, Crew 2000, Edinburgh, UK
Mireia Ventura, Energy Control, Spain
Michaela Goecke, Bundeszentrale für gesundheitliche Aufklärung (Federal Centre for Health
Education), Germany

12:00 **Concluding remarks**

<http://www.uniklinik-freiburg.de/rechtsmedizin/live/SpiceConference.html>

Analytical and clinical experiences – from product monitoring to drug testing

V. Auwärter, M. Hutter, S. Kneisel

Institute of Forensic Medicine, Forensic Toxicology, University Medical Center Freiburg, Germany

Products containing synthetic cannabinoids have become a challenge for many professions, among them medical staff and chemists, but also staff working in the area of drugs prevention or drugs counselling.

In the frame of the SPICE project we conducted a continuous product monitoring providing information on the substances used as active ingredients for these products. Since 2008 more than 40 different compounds appeared in 'herbal mixtures' and the product composition was constantly changing in terms of type and amount of added drugs. In Germany we observed a quick reaction of the producers to legislative measures in the first years. Interestingly, the shift to new substances was observed even before new regulations came into force. Further observations were a trend to the use of high affinity cannabinoid receptor agonists and the appearance of rather exotic modifications, many of them not described in the scientific literature before. Recently, producers seem to partially revert to already legally controlled substances like JWH-018.

The continuous monitoring of the Spice product market enabled us to develop up-to-date methods for the detection of synthetic cannabinoids in blood, urine, oral fluid and hair. These methods help to mitigate one of the major motivations for the use of these drugs – the lacking detectability by commonly used drug test systems. However, these methods are effective only if they comprise the complete spectrum of available cannabimimetics, making method development an extremely complex and laborious task. Moreover, interpretation of analytical results may not be trivial in individual cases.

Using these methods we were able to analytically confirm a series of severe intoxication cases hospitalized after Spice product use, demonstrating in particular the health risks for first time users and high dosed consumption. Adverse effects involve psychotic disorders and other symptoms reported after intake of high doses of cannabis like palpitations or agitation/somnolence. However, the intensity of the symptoms and additional symptoms typically not seen after cannabis intoxication like seizures and vomiting give cause for major concern. The number of intoxication cases in southern Germany remains high since early 2012 and several death cases connected to the use of synthetic cannabinoids occurred. From this perspective, the use of such products can be judged as considerably more dangerous than the use of natural cannabis.

Assessment of toxicological properties and establishment of risk profiles - genotoxic properties of selected spice compounds

V.J. Koller, V. Auwärter, G. Zlabinger and S. Knasmüller

Institute of Cancer Research, Medical University of Vienna, Austria

Institute of Immunology, Medical University of Vienna, Austria

Institute of Forensic Medicine, University Medical Center Freiburg, Germany

Synthetic cannabinoids are increasingly marketed as alternatives to marijuana. At present, scarce data on their toxicological properties on the cellular level are available. Therefore, the aim of the present study was to investigate the effects of widely used compounds. Four representatives of naphthoylindoles (JWH-018, JWH-073, JWH-122 and JWH-210), one benzoylindole (AM-694), and one cyclohexylphenol (CP-47,497-C8) were investigated. THC was included as a reference compound. The acute toxicities were studied in test systems which allow to discriminate between different modes of action: Changes of mitochondrial functions were assessed by determination of the succinate dehydrogenase activity (XTT-assays); alterations of the proliferation rates were monitored with sulforhodamine B (SRB); damage of cell membranes by measurement of the release of lactate dehydrogenase (LDHe); neutralred assays were used to detect alterations of the integrity of the cell membranes and lysosomal activities. In addition, we investigated the impact of the drugs on the immune functions and examined their xenoestrogenic activities as well as their genotoxic properties.

Different human cell lines were used as indicator cells. The hepatoma line (HepG2) possesses a broad spectrum of phase I and phase II enzymes and both cannabinoid receptors; a buccal epithelial cell line (TR146) was included as the oral cavity comes into direct contact with the drugs. The mammary line MCF-7 was chosen as earlier studies with THC are available; the human bone cell line (U2-OS) was used for estrogenic studies and peripheral blood mononuclear cells (PBMCs), isolated from healthy human donors, were investigated to study the impact on cytokine release after bacterial stimulation with LPS.

Our results show that all compounds cause low or moderate acute cytotoxic effects and only one (CP-47,497-C8) was active at concentrations below 10 μM . The most sensitive endpoint for all agents was the LDHe assay in which acute toxic effects were seen in mammary and buccal cells at concentrations $\geq 100 \mu\text{M}$. CP-47,497-C8 was already active at 7.5 μM in this test. No effects were seen up to levels of 3 μM in human PBMCs on cytokine release. At the highest dose levels (10 μM) moderate alterations of the secretion of TNF α and IL12p40 and IL-10 were seen with JWH-122 and JWH-210 and CP-47,497-C8. Estrogenic and anti-estrogenic activities were tested and compared with tamoxifen and 17 β -estradiol as reference compounds. Effects were again restricted to high dose levels (EC20 values were between 2.1 and 23 μM); the highest activities were observed with JWH-122 and JWH-018.

The most interesting observation was that some cannabinoids induced DNA-damage. For example, a clear effect was seen in TR146 and HepG2 with JWH-073 and JWH-122. The most pronounced effect was detected in comet assays with CP-47,497-C8 at concentrations $\geq 10 \mu\text{M}$. With the latter compound additional experiments were conducted in which the formation of micronuclei was studied in two cell lines. Also in this case, clear effects were seen.

Detection of synthetic cannabinoids in human specimens

Ilkka Ojanperä, Mira Sundström and Anna Pelander

Hjelt Institute, Department of Forensic Medicine, PO Box 40, FI-00014 University of Helsinki

Synthetic cannabinoids exhibit considerable structural diversity, but they share some common features: their dose and blood concentrations are low, lipophilicity is high, and consequently only metabolites can be detected in urine. Comprehensive analytical methods, based on liquid chromatography – mass spectrometry (LC-MS), have already been developed for detection of the parent compounds in blood, hair or oral fluid. However, the standard sample material for drug testing is urine. Due to the poor availability of reference standards for metabolites of synthetic cannabinoids, urine screening methods have usually covered a very limited number of these compounds, making it difficult to keep up with the changing illicit drug scene.

Our objective was to develop a comprehensive screening method for synthetic cannabinoids together with other abused drugs in urine, based on ultra-performance liquid chromatography coupled to time-of-flight mass spectrometry (UPLC-TOFMS). UPLC provides excellent chromatographic separation while TOFMS produces high resolution and accurate mass data, allowing reliable and efficient identification of known compounds together with molecular formula generation for unknown compounds. The latter feature enables tentative identification of new drugs and metabolites even in a retrospective manner.

We have developed a combined urine screening method for synthetic cannabinoids, their major metabolites, cathinones, piperidines, tryptamines and phenethylamines, conventional drugs of abuse, and prescription medicines. The method is applicable to serum or blood samples after minor modifications. Sample preparation was carried out using solid phase extraction on Isolute HX-5 mixed-mode C4 and strong cation exchange functionalized silica. Four deuterated internal standards were used: MDMA-d5, codeine-d3, THC-COOH-d3, and JWH-018-d9. The instrumentation included a Waters Acquity UPLC coupled with a Bruker MicrOTOF-Q II. The analytical column was a Waters HSS T3, 2.1×150 mm with particle size of 1.8 µm, and flow rate was 300 µl/min. The mobile phase gradient components were (A) 2 mM ammonium acetate/0.1 % formic acid and (B) methanol. Positive ionization electrospray and broadband collision-induced dissociation (CID) were applied using a mass range of m/z 50-800. Mass fragmentation was investigated using ACD/Labs MSFragmenter and Bruker Smart Formula 3D software.

The database of 234 compounds, including 42 parent cannabinoids and 21 cannabinoid metabolites, consisted of the retention times and exact monoisotopic masses of parent compounds and CID qualifier fragments (Q1 and occasionally Q2). Substance identification was carried out by reverse database search by accurate mass, retention time, isotopic pattern, and qualifiers. In addition, the precursor molecular formula data was included for 26 metabolites, for which a reference standard was not available. A common fragment for many JWH analogues and their metabolites was found to be Q1 [C₁₁H₇O]⁺ = 155.0491 Da. This ion can be utilized in the tentative identification or exclusion of unknown compounds, followed by further confirmation using standards if necessary.

Cut-off concentrations (LOD) were determined for 80 compounds of which 57 were cannabinoids. For cannabinoids the LOD ranged from 1 to 100 ng/ml. For cannabinoids with an N atom, LOD ranged from 1 to 60 ng/ml, and for cannabinoids without N, LOD ranged from 40 to 100 ng/ml.

Prevalence of SPICE products in Finland

Teemu Gunnar, National Institute for Health and Welfare, Helsinki

An increasing number and wider use of new psychoactive substances (NPS) has forced authorities to reconsider legal system in Finland. In June 2011, the Narcotics Act was changed to speed up the classification of NPS for more efficient control measures. Since then, the addition of new substances to the illegal drug list has not required an amendment to the law. The law was applied for a group of NPS in March 2012 when the first three synthetic cannabinoids (JWH-018, JWH-073, JWH-081) were classified as illegal drugs. These compounds were already classified as medicines under the Medicines Act in 2009 and 2010, where also several other synthetic cannabinoids have been listed during the last years. An addition under the Medicines Act means that it is illegal to import them without authorization (though with smaller sanctions).

Synthetic cannabinoids, either mixed with plant material or increasingly in powder form, have been confiscated since 2008 in Finland. These compounds are almost exclusively ordered from the Internet and most of the drug seizures are made in incoming mail by the Finnish Customs. A number of different synthetic cannabinoids have markedly increased in drug seizures. Still, JWH-018 and JWH-073 have been among the most common ones for years. This year, at least partially due to the change of legal status of the above-mentioned compounds, other candidates, such as AM-2201 have taken over them.

Despite an increasing number of different synthetic cannabinoids coming across the Finnish border, prevalence of synthetic cannabinoid use seems to have remained relatively stable for last two years or so based on available sources of information. This statement can be supported by drug seizure statistics from the Finnish Customs and Police, and also by analytical toxicological data. Nevertheless, prevalence of synthetic cannabinoids may be partially underestimated due to the lack of information on synthetic cannabinoid use and non-effective preliminary screening methods based on immunological techniques, which are typically used in, e.g., hospitals, prisons, psychiatric clinics and rehabilitation clinics. Therefore, synthetic cannabinoid use may remain undetected and samples will never arrive to a toxicological laboratory for unequivocal identification of compound(s) by chromatography mass spectrometric analysis.

In conclusion, synthetic cannabinoids have frequently been confiscated in Finland – some of them for the first time in Europe. However, traditional illicit drugs and, e.g., some synthetic cathinones, such as MDPV, have remained the most problematic drugs of abuse in Finland.

Effects of synthetic cannabinoids, identified in smoked herbal products, on synaptic transmission in the brain

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Introduction

Products from *Cannabis sativa* have long been used by humans for medical and recreational purposes. The psychoactive ingredient in these products is Δ^9 -tetrahydrocannabinol (Δ^9 -THC), and its primary target in the brain is the G-protein coupled CB1 cannabinoid receptor (Pertwee et al., *Pharmacol Rev* 62: 588–631, 2010). Recently, synthetic cannabinoids were introduced to the drug market: harmless herbal mixtures for smoking ('Spice', 'Yucatan Fire', 'Sence', 'Smoke'...) are 'enriched' with such synthetic cannabinoids. Our aim was to characterize the synaptic effects of two frequently used synthetic aminoalkylindoles (JWH-018 and JWH-210).

Methods

250-300 μm -thick slices were prepared from the cerebella of young NMRI mice and superfused with artificial cerebrospinal fluid. Purkinje cells in the cerebellar cortex were patch-clamped and GABAergic spontaneous inhibitory synaptic currents (sIPSCs) were recorded with techniques described previously (Kovacs et al., *Brit J Pharmacol* 162: 974–988, 2011).

Results

At first, the reference aminoalkylindole WIN55212-2 was studied. WIN55212-2 (5 μM) did not affect the amplitude of sIPSCs, but significantly lowered their frequency (by $36 \pm 9\%$) and cumulative amplitude (by $48 \pm 7\%$). These effects were similar to those observed previously (e.g., Szabo et al., *Neuroscience* 85: 395–403, 1998). JWH-018 (0.1 and 1 μM) had no significant effects on the sIPSCs recorded in cerebellar Purkinje cells. JWH-018 (5 μM) did not change the amplitude of sIPSCs, but significantly decreased their frequency (by $39 \pm 8\%$) and cumulative amplitude ($50 \pm 8\%$). JWH-210 (1 μM) did not change the amplitude, but lowered the frequency (by $25 \pm 6\%$) and cumulative amplitude (by $34 \pm 10\%$) of sIPSCs.

Conclusions

The two recently abused synthetic cannabinoids JWH-018 and JWH-210 lowered the frequency and cumulative amplitude of sIPSCs, but did not change their amplitude. These effects were very similar to the effects of the reference cannabinoid receptor agonist WIN55212-2 and indicate that these aminoalkylindoles inhibit GABAergic synaptic transmission with a presynaptic mechanism. Presynaptic inhibition of synaptic transmission is the dominant primary neuronal effect of cannabinoids and is used to explain many behavioural, cognitive, motor and autonomic effects of cannabinoids (Szabo and Schlicker, *Handb Exper Pharmacol* 168: 327–365, 2005).

Measures in Switzerland in the fight against new drugs such as „SPICE“ products and „bath salts“

Werner Bernhard, Lars Ambach and Wolfgang Weinmann
Institute of Forensic Medicine, University of Bern, Switzerland

Legislation

In July 2011, a new addition to the Swiss controlled substances act (BetmVV-EDI) called “Schedule e” came into effect, in order to counteract the increasing numbers of novel psychoactive substances (NPS, e.g. “legal highs”). In contrast to the already existing laws, it allows a speedy, provisional listing of both generic structures and single substances. Whereas it previously took up to several years to schedule a new compound, with the new “Schedule e” this can now be done in a timeframe as short as 3 months. The expansion of the list of scheduled compounds is managed by Swissmedic, the Swiss Agency for Therapeutic Agents. Furthermore, it requires the approval of the minister of the interior. Since coming into effect, “Schedule e” has been updated once in December 2011. An additional 40 substances were submitted in May 2012, although these are still pending approval.

Another legal tool for handling NPS is the Swiss customs law, which enables the Swiss Border Guard to seize suspected chemicals and medications crossing the Swiss border by mail, rail, road or air. Furthermore, the Tobacco Act can also be applied to “SPICE” products and similar herbal mixtures, as it expressly forbids the sale of products intended for smoking that pose an immediate or unexpected danger to health or have psychotropic effects. Additionally, smoking products containing tobacco substitutes must be approved by the ministry of health before sale.

With the Federal Commission on Drugs (Eidgenössische Kommission für Drogenfragen, EKDF) there is also a body of legal, socio-medical and chemical experts to advise the government and the parliament on questions concerning priorities in drug politics.

Law Enforcement

The enforcement of the legislation is aided by the Leading Routine Laboratory of the Forensic Institute Zürich which analyses confiscated material submitted by police and customs forces. Detected new substances and products are added to a collection of “Fact Sheets”, that is available to Swiss law enforcement agencies. Their work is also financially supported by the federal government.

Research

In order to maintain an edge over the producers and suppliers of NPS, constant research is imperative. The Institute of Forensic Medicine Bern (IRM Bern) is an associate partner in the EU Spice project and is concerned with developing analytical methods for the detection of listed and new compounds in blood, urine, hair and confiscated materials (e.g. tablets, powders and other preparations) in collaboration with other EU project partners (Institute of Forensic Medicine Freiburg, Germany). New analytical procedures are disseminated via the Workgroup of Forensic Toxicologist of the SGRM (Swiss Society of Forensic Medicine). A mass-spectral library database for use with LC-MS/MS methods is in development. At the IRM Bern there is also on-going research into the generation of NPS metabolites by electrochemical oxidation to further extend detection methods. This work is supported by the federal government.

Prevention

In Switzerland, there are several preventions initiatives such as Safer Party and Rave It Safe that provide informative websites aimed at harm reduction. In several cantons, they also offer analytical drug checking for users. Some NPS have already been included in the educational material of these initiatives. Their existing infrastructure may also provide a foundation for future prevention efforts focused on NPS.

“Legal” Highs in the legal system

Michael Pütz

Federal Criminal Police Office, Forensic Science Institute, D-65203 Wiesbaden, Germany

In recent years a new phenomenon on the illicit drug market increasingly gained in importance all over the world – the substitution of classic drugs by allegedly legal alternative products containing new designer drug substances with comparable psychotropic properties. Most important in this context are herbal mixtures, sold and marketed a. o. as herbal incense but used as a substitute for Marijuana with synthetic cannabimimetic designer drugs, typically aminoalkylindoles (e.g. from the JWH- and the AM-series) as the psychoactive ingredients. Other examples are “bath salts”, powdered products containing synthetic derivatives of cathinone with amphetamine-like effects or “Herbal Ecstasy” capsules containing piperazine designer drugs with effects comparable to MDMA.

Typically, the biggest share of the products that are sold in a certain period of time do not contain substances that are listed in the annexes of the Narcotics acts in many countries at that time and are immediately replaced by new designer drugs of the same class in case of submission. As a consequence, a big fraction of the professional illegal trade of designer drugs can only be prosecuted as a violation of the medicines law (e.g. in Germany the “Arzneimittelgesetz”, AMG). This situation has not only caused enormous problems for legislation and criminal prosecution, but also for the forensic laboratories with new synthetic substances surfacing every few weeks, some of them only marginally treated in the scientific literature and most of them not commercially available as reference compounds and their analytical characteristics (especially MS-, IR- and NMR-spectra) not listed in commercially available databases or published in any way.

This development imposes tremendous instrumental-analytical challenges to forensic laboratories that are concerned with seizures of new designer drugs and the meanwhile almost innumerable amount of different products on the market. In this contribution some of the analytical methods and techniques are presented alongside of examples from forensic case work, that have proven to be helpful or even necessary for the elucidation of the chemical structures of completely new designer drugs, namely NMR and High-Resolution-MS. A further focus will be rapid analysis techniques that are appropriate for the examination of a significant number of items of evidence like ion mobility spectrometry (IMS), mobile FT-IR spectroscopy and Desorption-Electrospray-Ionization-Mass Spectrometry (DESI-MS). These mobile analysis techniques can also be used for the rapid analysis of seized items of evidence at crime scenes which is important because only few colour quick tests or ELISA tests for designer drugs, especially herbal mixtures with cannabimimetic active ingredients are commercially available, and typically they are restricted to designer substances that have already vanished from the illicit drug market again because of legislative measures.

Social research on synthetic cannabinoids: A synopsis of the available data

Cornelia Morgenstern & Bernd Werse, Centre for Drug Research, University of Frankfurt

To date, almost all European countries have implemented legal controls on the first synthetic cannabinoids that came to prominence (e.g. JWH-018), although the legal status of the general group of these substances differs substantially between European countries. Countries like UK, having introduced a generic approach on legal highs. Other countries like Italy have applied analogue laws. In addition, several other legal tools (e.g. customs law, pharmaceutical law, consumer protection or temporary bans) have been adopted for regulating new psychoactive substance. In various European countries, Spice products have gained a considerable media attention and it appears to be the case that media interest and the prevalence of synthetic cannabinoids are strongly related.

So far, little is known about the prevalence of synthetic cannabinoids. An annual local representative students' survey in Frankfurt shows that the number of 15- to 18-year-olds who had ever used 'herbal incense' increased from 6% in 2008 to 9% in 2010, followed by a decrease to 7% in 2011. Similar proportions could be observed among the same age group in a survey conducted 2009 in Hamburg, with 6% reporting lifetime use of Spice products. Among the German adult population (18-64 years) surveyed in 2009, the lifetime prevalence of Spice was 0.8% and the last year rate 0.4%. In a UK survey conducted in 2010, last year use of Spice (or other synthetic cannabinoids) amounted to 0.2% among 16- to 54 years-olds and to 0.4 percent among 16- to 24-years-olds. A study in Switzerland carried out in 2011 among 18- to 20-year-old males revealed a lifetime prevalence of 1.4% for Spice products with 0.5% having smoked herbal incense in the past 12 months. There are several other national and international surveys, asking for the general prevalence of legal high products, where considerably higher percentages for new psychoactive substances have been detected. Some non-representative studies indicate that the prevalence of Spice products, in relation to the use of other legal highs, might differ substantially between countries or even regions.

While prevalence data are sparse, scientific information on specifics, types and motivations of legal highs users is virtually non-existent. In order to gain more information on this special group of drug users, the Centre for Drug Research (CDR) at Frankfurt University carried out two online surveys, one in Germany and one in Switzerland. Both surveys directly addressed persons experienced in using legal high products. The design of the questionnaire based on the results of an online monitoring of new psychoactive substances. Both studies show that the largest group of users are experimental users, their primary reason for using Spice products being curiosity. Based on the data gained from the online surveys, different types of regular legal highs users were identified, with one type being called "Pothead 2.0": In this rather large group, cannabis and its 'legal' alternatives are used alternately, depending on the availability of illicit drugs and other requirements. Consequentially, such a pattern is more likely to occur when the availability of cannabis is limited. Another type of herbal mixtures users are the "substitutors", a rather small group of users who have completely switched from illegal cannabis to Spice products, mainly because of concerns regarding law enforcement practices and/or drug testing (in traffic checks, at workplaces or drug treatment). Interviews with employees of drug counseling services and treatment facilities produced similar results on users' motivation.

The availability and quality of cannabis seems to play a considerable role for the prevalence of Spice products. For example, indicated by employees of drug monitoring and drug service institutions, the use of synthetic cannabinoids appears to be comparatively low in the Netherlands and in Spain.

It can be concluded that the use of Spice products is more likely to occur in settings with more repressive conditions. Since synthetic cannabinoids are primarily used as a substitute for cannabis, limited availability of hashish and marijuana, and/or increased concerns about potential legal sanctions seem to encourage users to switch (temporarily) to herbal mixtures.

Legal highs in Poland

Michał Kidawa

National Early Warning System, National Focal Point, National Bureau for Drug Prevention

Background and objectives

Poland was one of the countries where the legal high phenomenon developed very rapidly. In two years (from 2008 to 2010) the number of street shops offering new psychoactive substances increased from 40 to over 1200, despite legal efforts to stop the phenomenon (like delegalizing a large number of substances). At the end of 2010 the new act of law was passed. The act bans manufacturing or introducing so-called substitute drugs to trade. According to Article 52a of the Act, violating the ban on introducing substitute drugs to trade is subject to a fine ranging from PLN 20 000 to 1 000 000 (~5.000 – 260.000 euro). Most of the shops were closed down and the size of the phenomenon started to decline. The dynamics of the legal high phenomenon was also visible in various studies conducted from 2008 up to date and data from Poisoning Information Centers, as well as EWS. The objective of this presentation will be to present the legal high phenomenon from its early stage to the present day based on various sources of information like general population surveys, youth surveys, Poisoning Information Centers data and EWS data in order to give a comprehensive picture of that phenomenon in Poland and the impact of legal changes on the market of new psychoactive substances in Poland.

Methods

The data presented will be based on various sources. Sources of the data will be general population surveys on representative samples of population age 15-75 conducted in 2009 and 2010, youth survey on representative sample of school students conducted in 2008 and 2010 and results of ESPAD study in 2011. In all studies the question concerning the consumption of legal highs was added. Additionally the data concerning the substances reported to Polish EWS in the framework of annual reporting and data on poisoning cases gained from Poisoning Information Center will be presented.

Results

Results from all sources confirm that after the increasing trend in use, trade and poisoning in the period till 2010 we have encountered a decrease in almost all indicators except the number of substances reported to EWS. By the legal ban imposed at the end of 2010 the size of the phenomenon decreased, but it did not disappear. It changed its character. But despite that it is still present on the Polish drug scene.

Comparison of estimated normative beliefs of peers regarding the use of synthetic cannabinoids and of actual consumption rates among students. Findings of a German subsample of a European ‘social norms’ intervention study.

Stefanie Helmer, Institute for Epidemiology and Prevention Research GmbH (BIPS), Bremen

Background

In the USA the social norms approach is a widely used intervention strategy to reduce rates of harmful drug use in university and college students. This approach is based on the assumption that incorrect perceptions of high rates of peer drug use, which are shown to be common in student populations, are predictive of an increased personal drug use. A correction of these misperceptions may lead to a reduction of social pressure on the individual and may consequently reduce personal drug use. To date, little is known about perceived social norms regarding synthetic cannabinoids and about the consumption rates of this group of drugs in German university students.

Methods

Data came from an EU-funded study conducted in seven European countries. In Germany, 471 students (58.8% female) completed questions on personal drug use and on their perceptions of rates of drug use among their peers. Furthermore, attitudes towards personal and peer drug use were assessed.

Results

A large percentage of students overestimated the rates of synthetic cannabinoid use among their peers. Although 91.8 % of male and 96.8 % of female students reported no synthetic cannabinoid use in the past two months, more than 50 % of the respondents thought that the majority of their peers had used them at least once in the past two months. 80.0% of the students (77.2 of the male and 82.1 % of the female students) did not think that it was okay to use synthetic cannabinoids, whereas only 57.7% of the male and 53.6% of the female participants thought that the majority of their peers did not think it was okay to use synthetic cannabinoids. Less than 10 % of the students thought that the majority of their peers accepted the frequent use of synthetic cannabinoids if it did not interfere with study or work.

Discussion

German university students appear to overestimate the use and acceptance of synthetic cannabinoids in their peer group. Future research should examine the efficacy of interventions targeting norm misperceptions regarding the use of synthetic cannabinoids.

Stefanie Helmer is a research scientist at the Institute for Epidemiology and Prevention Research GmbH (BIPS) in Bremen and co-ordinator of the SNIPE project. SNIPE (Social Norms Intervention for the prevention of Polydrug use) is an EU-funded collaborative research project of seven universities across Europe. The aims of the SNIPE study are to assess rates of licit and illicit drug use in seven European countries and to examine the feasibility of delivering a web-based personalized social norms feedback intervention targeting drug use among college- and university students. Stefanie Helmer received a Master of Public Health Degree from the University of Bielefeld in 2009 and is currently a doctoral student at the School of Public Health at Bielefeld University.

Speakers on prevention issues

Renate Lind-Krämer

Renate Lind-Krämer is deputy head of the Drug Coordination Department of the City of Frankfurt. She is psychologist and has been involved in developing and coordinating drug prevention and intervention programmes in Frankfurt since 1991.

As part of the Health Department, the Drug Coordination Department is responsible for implementing drug policy at the local and community level. This includes the development and implementation of new demand-oriented programmes in the fields of prevention, early intervention and drug services. Besides the well-known harm reduction programmes and the “Monday round”, these are the drug trend monitoring system “MoSyD”, the peer prevention project “Alice”, the internet cemetery for avatars www.herolymp.de, and the website www.Legal-High-Inhaltsstoffe.de.

Karsten Tögel-Lins

Karsten Tögel-Lins, qualified social education worker, university of applied sciences Frankfurt Main. Basis e.V., Project www.legal-high-inhaltsstoffe.de

Karsten Tögel-Lins has been working in different drug prevention programs since 1994. He is one of the founders of “Alice, the Drug and Culture Project”, a peer prevention project for club and nightlife scenes. He is also one of the initiators of the project www.legal-high-inhaltsstoffe.de, an online counselling platform, particularly for users of research chemicals and their relatives. He is involved in the online counselling service, email counselling and the web-work in online user forums, a new form of “street work” in the web.

Karsten Tögel-Lins has additionally skills in chemistry and behaviour therapy.

Alexander Bücheli

Master in Community Development (MA), University of Applied Sciences Social Work
City of Zürich, Department of Social Affairs, youth counselling Streetwork

Alexander Bücheli works since 2001 for the youth counselling Streetwork of the City of Zurich. He is responsible for the recreational drug prevention and harm reduction program in Zurich’s Nightlife Culture. This offer includes mobile Drug Checking, the Drug-Information-Centre (DIZ), the website Saferparty.ch, Zurich’s Nightlife Round Table, the association Safer Clubbing, the Bar and Club commission and to held trainings about the risk of using recreational drugs. Further projects are early detection and intervention at the nightlife setting, developing Drug Checking standards in the frame work of the TEDI project and the building up of the national Safer Nightlife Switzerland network. Grace to the integrative approach, the youth counselling Streetwork is one of the leading Swiss Nightlife prevention institution.

John Arthur

John Arthur is the National Director of the Multi Award winning community health project 'Crew 2000 (Scotland)' and has worked with drugs users in both a professional and voluntary capacity since 1993. Having set up a number of projects and initiatives covering areas such as street-work with drug users he has developed early intervention strategies with heroin users, established drugs information and recovery support services and has been a leading spokesperson for harm reduction.

John also provides training around harm reduction approaches and recovery community development to a variety of key professionals such as: Police, Medical Staff, Social Services, Drugs and youth workers. He has worked and collaborated on projects and research across the EU and beyond and is often sought out for media interviews.

Working with people who use drugs throughout this time John has supported people to stabilize, reduce or stop their drug use. John continues to work with people who are attempting to recover from addiction from legal and illegal substances including alcohol and cocaine.

John is a Board member of the Scottish Drugs Recovery Consortium, Steering Group Member of the Serenity Café Edinburgh and a member of the UK Expert Witness Institute. Holds a BA in Community Education and PG Certificate in Addiction Studies.

Mireia Ventura

Mireia Ventura is a pharmacist Ph.D and she is working as a coordinator of the Drug Checking service of Energy Control. The Drug Checking service of Energy Control aims to monitor the evolution of the content of synthetic drugs, identify new or dangerous substances and contact with drug users. Mireia Ventura is also the NEWIP TEDI manager. The Trans European Drug Information project (TEDI) is a network of European fieldwork Drug Checking services that share their expertise and data within a European monitoring and information system. TEDI's chief aim is to improve public health and intervention programs.

Michaela Goecke

Michaela Goecke, M.A. is head of the unit "Prevention of substance abuse, addiction prevention" of the Federal Centre for Health Education (BZgA), Cologne.

One of the tasks of the Federal Centre for Health Education as an authority in the portfolio of the Federal Ministry of Health is the implementation of national prevention programmes in the field of drug abuse - especially on alcohol prevention, tobacco prevention and prevention of illegal drug use as well as on the prevention of gambling addiction and online-gaming addiction. Also, the Federal Centre for Health Education offers special prevention programmes focussing on life-skills-trainings for young children in order to promote a drug-free life-style as early as possible.

Since 2001 the Federal Centre has been running the website www.drugcom.de which comprises thorough and continuously updated information on the risks of illegal drugs including "legal highs". The website is one of the most frequented websites of the Federal Centre for Health Education.

<http://www.uniklinik-freiburg.de/rechtsmedizin/live/SpiceConference.html>

