QUARTERLY NEWS
April 2012 Vol. 3 Issue 2

Legal High: Synthetic Cannabinoids (Spice/K2) Designer Stimulants (Bath Salts)

by Joseph Jones, MS. NRCC-TC

A new trend has emerged in the past few years of using designer drugs for a "Legal High," drugs that produce a euphoric high but not listed as Controlled Substances. Two broad categories have become popular namely Synthetic Cannabinoids (K2/Spice) and Designer Stimulants (Bath Salts). These compounds are not typically included in routine drugs of abuse testing and must be specifically ordered. Only a handful of laboratories offer testing for Synthetic Cannabinoids and Designer Stimulants at this time. In response to the rapid increase of inquiries (just over 200 inquires in 2010 to over 4500 in 2011) to the 57 Poison Control Centers nationwide, both classes have been recently scheduled by the DEA because of their addiction potential and negative health outcomes for the public.

A series of Synthetic Cannabinoids (over 250 compounds) were first synthesized three decades ago at Hebrew University and Clemson University in the hopes of stimulating the appetites of patients undergoing certain treatments. Unfortunately, the risks associated with use exceeded the desired benefits. A few years ago, these compounds were resurrected and marketed as a way of obtaining a "Legal High" because the compounds produce a euphoria similar to marijuana but until recently were legal to distribute and possess. The vast majority of the Synthetic Cannabinoid in the United States contains varying amounts of JWH-018 and/or JWH-073, two of the compounds in the series.

Photo courtesy of DuPage County Sheriff Dept.

Another group of new drugs are the so called Designer Stimulants. These compounds are structurally related to methamphetamine and/or cathinone (khat) and produce a stimulant effect similar to methamphetamine, cocaine, and/or PCP. These compounds are highly addictive and are commonly referred to as "Bath Salts." These preparations often contain the drugs methylone, methylenedioxypyrovalerone (MDPV), mephedrone, MDMA (ecstasy), MDA (The Love Drug) or MDEA (Eve).

References:

Wilson, J. (December, 2011) DEA Classifies Bath Salt and Spice Products as Schedule I. *Clinical and Forensic Toxicology News*, Washington, DC: AACC.

Centers for Disease Control and Prevention, (May, 2011) Emergency Department Visits After Use of a Drug Sold as "Bath Salts." *Morbidity and Mortality Weekly Report*, Atlanta, GA: CDC.

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Long Term Alcohol Biomarkers by Joseph Jones MS, NRCC-TC

Excerpted from DATIA Fall 2011
(Full article available at www.usdtl.com)

Alcohol abuse continues to be a significant health concern for the United States. In the United States, 15.3 million people are categorized as having an alcohol use disorder. Additionally, another 2.3 million have both an alcohol and drug use disorder (Stinsonet al, 2005). According to the Judicial Council of California, a survey of family law judges indicated that more than 50% of child custody decisions involved alcohol and drug abuse as a factor (Center for Families, Children & the Courts, 2007).

Reliable and objective measures of alcohol consumption can assist legal, healthcare, and addiction treatment professionals with the evaluation and monitoring of their clients and allow the local substance abuse professional an opportunity to expand their list of available services in their community. Traditional methods to identify and evaluate individuals with alcohol use disorders have limited utility because of participant self-incrimination and recall bias. Indirect alcohol biomarkers measure the biological effects of abusive alcohol consumption and are not 100% specific to risky alcohol behavior.

Many situations exist that would benefit from sensitive and specific alcohol biomarkers that detect abusive alcohol consumption.

FAEE Hair

The first long-term alcohol biomarker that came to this market was testing for Fatty Acid Ethyl Esters (FAEEs) in hair. FAEEs are a group of non-oxidative metabolites that are produced in the presence of ethanol and various fatty acids. FAEEs can be found in a number of specimen types such as hair, fat and a variety of organ tissues.

Testing for FAEEs in hair has two main drawbacks. The use of ethanol containing hair care products will produce detectable amounts of FAEEs in the hair and the exposure of clipped hair to ethanol vapor will produce FAEEs in the hair sample (Gareriet al, 2011).

EtG Hair

EtG is a minor metabolite of ethanol produced by the conjugation of ethanol with glucuronic acid. The Society of Hair Testing claims that a 1½-inch hair sample containing greater than 30 pg/mg of EtG is a strong indicator of "chronic excessive alcohol consumption" during the previous three month period.

One limitation of using hair for EtG analysis is that certain hair care treatments (bleaching, permanent waving, dyeing) negatively affect hair EtG levels (Morini et al, 2010). This limitation must be considered when attempting to declare that a donor has been abstinent. This observation was independently confirmed in a report recently released at the Research Society on Alcoholism's (RSA) national conference in June 2011 (Jones et al, 2011).

EtG Nail

Fingernail, which grows approximately 3 mm per month, is very similar in structure to hair in that it is composed of keratinized protein. Originally, it was assumed that analytes were incorporated into the nail where it originates (the matrix). Under this assumption, a clipping of nail would give a two-week history that occurred 6 months ago, severely limiting the usefulness of this specimen type. This assumption was proved to be incorrect in 1991 when analyzing fingernails following the oral administration of a new fungicide (Johnson et al, 1991). Johnson et al (2011) found that the drug was appearing in the nail clippings after a couple of days indicating that another mechanism was occurring. The researchers proved that not only was the drug incorporated in the matrix (where the nail material originates) but that nail material (and drug) was being incorporated from underneath as the nail grows along the nail bed toward the tip of the finger.

The nail gets thicker as it grows in length. A simple clipping of fingernail provides a history of the entire trip down the nailbed. The National Institute of Alcohol Abuse and Alcoholism (NIAAA) funded a study (1R44 AA016463-02) that included the collection of head hair, fingernail, and an extensive battery of self-report questionnaires to 606 college-aged students. The hair and fingernail specimens were analyzed for EtG at our laboratory.

The preliminary results of this study were released at the RSA national conference in June 2011 (Jones et al, 2011). The findings of the study were twofold. First, a gender bias may exist when using hair for EtG analysis. Secondly, EtG in both hair and nail was not found unless the participant engaged in risky alcohol drinking behavior (binge drinking).

Phosphatidylethanol (PEth)

A new test that has become available recently is Phosphatidylethanol (PEth) in blood. PEth is an abnormal phospholipid that is formed only in the presence of ethanol and has been reported in a number of tissues and fluids. Once produced in humans, it is incorporated into cell membranes where no enzymatic or metabolic mechanism of elimination is available. PEth decomposes with a very predictable half-life of 4-5 days giving a detection window of 2-4 weeks depending on the starting levels. Testing blood for the presence of PEth has been used for several years by various medical examiners in Europe to gain insight into the alcohol history of decedents during post-mortem examinations. Several laboratories in the United States are now offering this assay routinely. Originally, the assay required a venipuncture performed by a licensed phlebotomist, making the collection too expensive or logistically problematic for widespread use. Most recently, the test has been adapted to using dried blood spots which allows for collection of a simple finger stick in a non-clinical setting without the services of an expensive phlebotomist (Jones et al, 2011).

Conclusion

The individuals with an alcohol use disorder outnumber those with a drug use disorder by a factor of over 4 to 1, yet our industry tends to emphasize drug testing. Because of a number of new breakthroughs, a new group of tests for detecting chronic excessive alcohol consumption are now commercially available to assist legal, healthcare, and addiction professionals assess the drinking behavior of their clients. The results of a combination of tests (EtG/EtS in urine, PEth in blood spot, and EtG in nail) reveal to the substance abuse professional the alcohol history of the donor over the past 3 days, 3 weeks, and 3 months. This level of information using objective measures is new and novel to our industry. These new tests provide the local substance abuse professional powerful additions to the evaluation tool belt, an opportunity to expand their offerings, and the opportunity to distinguish their level of services from their competitors. ♦

Bath Salt Abuse

By Paul Jannetto Nov. 2011 sMATTerings, Vol 17 Issue 1

In the 1980's, Calgon bath beads were an iconic television advertisement with the catch phrase, "Calgon Take Me Away." In 2011, bath salt abuse is taking people away on ambulance stretchers. Synthetic stimulants are being sold at convenience stores, tobacco outlets, gas stations, pawnshops, tattoo parlors, and truck stops as crystallized or powdered bath salts. These products are also marketed as bath crystals, plant food, and herbal incense typically with a disclaimer that states, "not for human consumption." Nevertheless, law enforcement officials throughout the country are reporting that bath salts have become prevalent as a drug of abuse.

Numerous brands are marketed in all 50 U.S. states and via Internet web sites. Common brand names include Blue Silk, Charge+, Ivory Snow, Ivory Wave, Ocean Burst, Pure Ivory, Purple Wave, Snow Leopard, Stardust (Star Dust), Vanilla Sky, White Dove, White Knight, and White Lightening. Bath salts are abused as recreational drugs typically by injection, smoking, snorting, or even eating the salts. The effects include agitation, an intense high, euphoria, extreme energy, hallucinations, and insomnia. The active ingredients in many brands are 3,4-methylenedioxypyrovalerone (MDPV) and/or mephedrone. The Drug Enforcement Administration considers these stimulants to be drugs of concern and is looking into the drugs being considered controlled substances.

In January 2011, United States Poison Control centers received over 220 calls related to bath salts which almost equals the total number of calls in 2010 (236 cases). Nationwide, male and female abusers of these substances range from teens to those in their 40's. Typically, patients present to the Emergency Room with increased heart rates, blood pressure, nausea, vomiting, confusion, agitation, and hallucinations. Users perceive these stimulants as legal drug alternatives. The bath salts are normally packed in 50 mg packets for $25 to $50 per packet. Historically, these products have been sold in other countries including the United Kingdom for several years, but due to the number of overdoses and deaths the products containing MDPV were banned in the U.K. on April 16, 2010. In the U.S. as of October 21, 2011 MDPV, Methylone and Mephedrone are now Schedule I substances controlled by the federal government.

References:

1. Drug Alert Watch Increasing Abuse of Bath Salts. U.S. Department of Justice EWS Report 000007 December 17, 2010.
2. Katherine Lymn. DEA Warns of Bath Salt Abuse. Star Tribune January 30, 2011.

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Up Coming Events:

1) April 18, 19	DATIA	San Antonio, TX	Booth 206
2) April 19-22	ASAM	Atlanta, GA	Booth 67
3) April 23-26	Federation of State Physician Health Program	Fortworth, TX	
4) April 25-28	Federation of State Medical Boards	Fortworth, TX	
5) May 19-22	National Association of Addiction Treatment Providers	Phoenix, AZ	
6) May 30-June 1	NW Conf. on Behavioral Health & Addictive Disorders	Seattle, WA	
7) June 9-14	College on Problems of Drug Dependence	Palm Springs, CA	
8) June 14-17	FSAM – FMPG	Orlando, FL	
9) June 23-27	Research Society on Alcoholism	San Francisco, CA	
10)June 29-30	GSAM	Charleston, SC	

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