Synthetic Hallucinogens – Backgrounder

What are synthetic hallucinogens?

Synthetic hallucinogens are a class of chemically produced novel psychoactive substances (NPS) made to have varying degrees of stimulant or hallucinogenic effects. The most common of these are known as the 2C and NBOMe family. The 2C family was first synthesized by American chemist Alexander Shulgin in the early 1970's. In 1991, he and his wife wrote a book where he described in detail the synthesis and personal experiences he had with all 2C drugs he had created. Since similar effect-producing drugs like MDMA and LSD were illegal at the time these drugs were created, synthetic hallucinogens began to be seen as a safer, "legal acid".

These drugs have a phenethylamine-based structure shared with amphetamines, catecholamines, and cathinones. They also have an affinity for 5-HT2, MAO-A, and MAO-B receptors. They have the ability to act as both as an agonist or antagonist depending on specific receptor subtype. Drugs within the 2C family have different reaction times, effects, and duration lengths. Some more closely resemble the effects of amphetamine or methamphetamine use, some resemble classic hallucinogens like LSD, and others a combination of both. One of the most common 2C drugs seen is called 2C-B ("nexus", "bromo", "venus") because of its similar effects to ecstasy. 2C-B has a hallucinogenic potency that is 15 times stronger than mescaline and can have up to 8.4-fold higher affinity for 5-HT_{2A} and 5-HT_{2C} receptors compared with LSD. Other 2C family drugs that have been reported to be used include 2C-E, 2C-I, and 2C-P.

Three 2C-phenethylamine derivatives, 25B-NBOMe, 25C-NBOMe and 25I-NBOMe have also become more available in recent years. The most popular is 25I-NBOMe (2-(4-idio-2, 5-dimethoxyphenyl)-N-(2-methoxybenzyl)ethanamine), also known as "25I", "N-Bomb", and "smiles". Invented in the early 2000s, this drug was first seized in 2012 in Sweden, as well as in labs throughout the European Union and China. Since this synthetic derivative is a full agonist of the 5-HT_{2A} receptor and has agonist activity at other 5-HT receptor sites, it displays a 14-fold higher potency over 2C-I, one of the stronger 2C family drugs.

Synthetic hallucinogens can be distributed in the form of blotting papers, liquids, tablets, capsules, or powders, and is normally ingested orally or insufflated; however, they can be smoked or injected. Onset can range from a few minutes to a few hours, depending on the specific drug. Likewise, these drugs can last anywhere from an hour to over 15 hours. Short-term effects of taking these drugs include pupal dilation, difficulty focusing, sweating, unusual body sensations, hallucinations, insomnia, agitation, numbness, and swelling of hands, feet, and face.

What are they used for?

Synthetic hallucinogens were first created with the intent of being used for psychotherapy purposes. 2C-B was particularly thought to be beneficial due to its short 1-hr duration; however, pronounced gastrointestinal effects and a lack of empathogenic (emotional openness) effects prevented it from ever being used. Currently, there are no therapeutic or industrial uses for any synthetic hallucinogens. With this being said, the NBOMe family drugs have been used as a tool in the field of neurochemistry, as well as health research looking at the pathogenesis of human disease.

Why are they so dangerous?

Although these drugs are not common, given the small dose required to produce an effect and lack of knowledge about them, the risk of overdose is significant. Many of these drugs are sold online as research chemicals or safe alternatives to LSD, despite them being neither. Pharmacokinetics and pharmacodynamics may vary between users, some users may be more susceptible to toxicity, and the substance or dosage may be different than what is thought/indicated. Additionally, these drugs have the potential to react with other substances that act on the serotonergic system, such as anti-depressant medications like SSRI's.

Doses lower than 10 mg have the potential to cause acute renal injury and metabolic acidosis. Higher doses can put users at risk of developing sympathomimetic syndrome, which can produce multiple symptoms like tachycardia, chest pain, agitation, seizures, and hypertension. High doses of synthetic hallucinogens can also result in serotonin toxicity when too much serotonin build up in the body; this can cause agitation, confusion, dilated pupils, loss of muscle coordination, muscle rigidity, and heavy sweating. Respiratory depression, seizures, and excited delirium may also occur from synthetic hallucinogen use. When a person develops excited delirium, the onset of violence, hyperactivity and cardiopulmonary arrest may also occur. This puts users at a significant risk, both to themselves and others.

Fatalities and treatment

Current data on fatal or nonfatal injury in Alberta linked to synthetic hallucinogens is not available; however, recent deaths and overdoses in Canada and internationally have been reported in the media. In 2015, police in Ontario had to restrain a 17-year-old who had begun to behave erratically after taking 25I-NBOMe. In 2017, a 17-year-old from Saint John was reported to have died after taking the drug. Also in 2017, six people in Saskatchewan were admitted to the hospital with overdose symptoms due to the synthetic drug 2C-B. Overdoses and deaths have also been reported internationally, particularly among teenagers and young adults.

Currently, there are no available treatments for synthetic hallucinogen overdoses. The use of benzodiazepines, rapid cooling, and sedation have been reported to be useful in detoxification, but their effectiveness across types of synthetic hallucinogens and individuals has yet to be determined.

Synthetic hallucinogens and the law

On April 15, 2016, 2C-phenethylamines and its analogues (including NBOMe's) became classified as a Schedule III drug in the Canadian Controlled Drugs and Substances Act. Possession of a Schedule III drug is punishable by a maximum of 3 years imprisonment; producing, trafficking, or exporting of a Schedule III drug is punishable by a maximum of 10 years imprisonment.

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