BEYOND THE BASICS

LSD & PCP

What are LSD & PCP?

LSD (lysergic acid diethylamide) is synthesized from lysergic acid, which is found in ergot, a fungus that grows on rye and various other grains.[2,3]

PCP (phencyclidine) is categorized as a dissociative drug and was originally developed for use as an anesthetic.[4,5]

LSD and PCP are hallucinogenic substances within the classification of club drugs, often used by youth and young adults at all-night dance parties, dance clubs, bars, concerts and parties to enhance the "rave" experience. These drugs are relatively inexpensive and are readily available.[1]

The popularity of hallucinogens is sometimes based on the incorrect belief they are "safe" drugs that enhance a person's enjoyment of an event by changing or enhancing their sensory experiences. They are also used to increase energy and facilitate staying awake for extended periods of time.[6]

Hallucinogens can cause people to think, communicate or behave irrationally because there can be a significant distortion in their perception of reality. The resulting behaviours may be bizarre and even dangerous. Users' moods may swing quite wildly, in part because they may be frightened by what they are experiencing.[4]

Street names for LSD include "acid," "blotter," "blotter acid," "dots," "microdot," "pane," "paper acid," "sugar," "sugar cubes," "trip," "window glass," "window pane" and "zen."[4]

Street names for PCP include angel, angel dust, boat, dummy dust, love boat, peace, supergrass, elephant, hog and zombie.[2,4]

Medical Use

There is no current medical use for either LSD or PCP.

While initial legitimate therapeutic use of LSD in the 1960s was for the purposes of enhancing psychotherapy outcomes, the drug was later criminalized and therapeutic use ceased.[7]

PCP was first developed in the 1950s for use in veterinary anesthesia and was never approved for human use because of the high incidence of psychiatric side effects noted during clinical trials.[4,5]

Prevalence of Use

A 2007 study of drug use among Manitoba students in grades 7 through 12 revealed that 2.8% of males and 1.9% of females used hallucinogens in the previous year.[8]

The Canadian Alcohol and Drug Use Monitoring Survey conducted in 2008 revealed overall use of hallucinogens at 2.1% of the population, with men being more likely to have used hallucinogens than women. Youth between the ages of 15 to 24 showed the highest rates of use at 10.2%.[9]

U.S. research indicates use of hallucinogens in general is less prevalent than other substances of abuse, with this group responsible for much less morbidity and mortality. The prevalence of disorders related to use of hallucinogens remains largely unknown.[7]

Pharmacokinetics

LSD starts as a clear or white, odourless, water-soluble crystalline substance. This form can be powdered to produce tablets or thin squares of gelatin called "window panes." Most often, LSD is dissolved, diluted and applied to blotter paper, the backs of stamps or sugar cubes. LSD is one of the most potent drugs of abuse, with doses varying between 25 micrograms to more than 300 micrograms. The most common dosage is 15 to 50 micrograms.[2,5]

LSD is usually administered orally and is rapidly absorbed, generally within 60 minutes, reaching peak levels in about three hours. The effects normally last two to 12 hours.[2,5]

PCP is available as powders, tablets, capsules, liquid, leaf mixtures, pastes and rock crystals.

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Concentration of the crystal form is usually between 50 and 90%, with the other forms generally ranging between 10 and 30%. A typical street dose is around 5 mg; however, testing of samples in drug labs has revealed dosages as high as 81 mg.[2,4,5]

PCP can be ingested, snorted or injected, but the most popular method of administration is sprinkling the powder on tobacco, parsley or marijuana, which is then smoked. It is well absorbed regardless of route of administration. Peak effects after oral ingestion occur after about two hours. Absorption from the lungs will generate peak effects in about 15 minutes. The effects of PCP can last for several hours, with some users reporting experiencing the effects of the drug for days at a time.[2,4,5]

Pharmacodynamics

Research suggests that many hallucinogens act on certain serotonin receptors primarily in the cerebral cortex, where mood, cognition and perception are managed, and the locus coeruleus, where sensory signals are received from all areas of the body.[2]

LSD produces its effects through interactions with specific subtypes of the serotonin receptor. LSD is also a partial agonist for certain dopamine receptors, which may contribute to its psychological effects. The effects of LSD on the serotonin system in the dorsal raphe nuclei disrupt the sensory sorting process, allowing a surge of sensory information that overloads brain circuits.[5]

PCP exerts its effects by altering distribution of glutamate and disrupting the functioning of NMDA receptor complexes. Noncompetitive antagonism of glutamate results in the psychotomimetic, analgesic, amnestic and schizophrenic actions of PCP.[4,5]

Short-term Effects

Depending on the dosage, users of hallucinogens may experience intensified or altered perceptions of colours, objects, time and distance. Users may experience synesthesia, a state in which a person may seem to hear or feel colours and see sounds. The altered perceptions may extend to their body and may result in sensations of relaxation or fatigue, separation from their bodies or surroundings, or a sense of heaviness or lightness. Thinking and concentration become difficult and short-term memory is impaired. Users may experience extreme mood swings, including joy, inspiration, depression, anxiety, panic and terror. Some users have reported feelings of invulnerability and exaggerated strength.[2-5]

The degree and content of the distortions or hallucinations resulting from use of hallucinogenic substances like LSD or PCP are typically reflective of the user's state of mind, their own psycho-dynamics, and the setting in which they take the drug and experience its effects.[6]

Physiological effects experienced with use of LSD or PCP can include abdominal discomfort, increased blood pressure and heart rate, dilated pupils, dizziness, loss of appetite, dry mouth or numbness of the mouth, sweating, nausea, hyperventilation and tremors. Motor skills and coordination may be impaired.[2-4]

In addition to the effects generally associated with hallucinogens, users of PCP specifically may experience strange and violent behaviour, sometimes involving paranoia, catatonia and garbled speech. Physical effects of PCP can include shallow, rapid breathing, elevated temperature and a generalized numbness of the extremities. At high doses, anesthesia, blurred vision, flicking up and down of the eyes, loss of balance, drooling and dizziness may occur. Users may also experience dangerous changes in blood pressure, heart rate and respiration, and decreased awareness of pain.[2,4]

Long-term Effects

Long term use of LSD may result in decreased motivation and interest for normal activities, or prolonged depression and anxiety.[2]

PCP is the only hallucinogen known to promote compulsive use.[5]

PCP, used over an extended period of time, may result in ongoing speech problems, memory loss, depression, weight loss, anxiety or toxic psychosis.[2,3]

There are two significant long term effects of the classic hallucinogens: persistent psychosis and hallucinogen persisting perception disorder (HPPD).[4]

Persistent psychosis is characterized by devastating psychological effects that transpire with use of the drug and persist after the effects of the drug have physically diminished, producing a psychotic-like state that can last for years. Effects of this state may include dramatic swings in mood from mania to severe depression, as well as visual disturbances and hallucinations similar to those experienced in the drug induced state. These effects can manifest in individuals who have no prior history or symptoms of a psychological disorder.[4]

HPPD, also known by users as "flashbacks," results in spontaneous, repeated and sometimes ongoing recurrences of some of the sensory distortions or hallucinations originally produced by the hallucinogenic drug taken. Like persistent psychosis, this condition is also enduring and may occur years after the individual stops using the drug.[4]

Toxic Effects

LSD use can result in a number of toxic effects, among them persistent or recurrent depression, exacerbation of pre-existing psychiatric conditions and "burnout," a chronic brain syndrome associated with disruption of personality.[5,6]

During PCP intoxication, severe side effects (uncontrollable convulsions, respiratory depression, high fever and a sudden surge of blood pressure resulting in intracranial hemorrhage) from large doses may lead to coma or death. Users are also at risk of accidental injury or suicide due to extreme psychological responses to the drug.[2-4]

Tolerance and Dependence

Use of LSD will quickly result in a high degree of tolerance for not only the drug being used but for other hallucinogens in the same class. After repeated use, the user requires larger doses to produce similar effects to those experienced initially; however, tolerance is also quickly diminished – the user needs only to stop taking the drug (or similar drugs) for several days to re-experience the drug's full effects. It should be noted that tolerance to LSD will not translate to tolerance for PCP or vice versa.[4]

Repeated use of PCP can result in physical dependence, and stopping use of the drug may result in withdrawal symptoms. Symptoms such as memory loss and depression may persist for as long as a year after a chronic user stops taking PCP.[4]

Withdrawal

When regular use of LSD is stopped, users may experience psychological cravings. Typically, even extensive LSD use will not result in withdrawal symptoms caused by physical dependence.[2,7]

PCP use can produce physical withdrawal symptoms.[4]

Illegal Production

LSD and PCP are made in illegal laboratories, so there are no regulations that ensure their purity and strength. Users cannot be certain about the quality of the drugs, the chemicals used to manufacture the drugs or the concentration of the drug present in its final form, making it extremely difficult to predict toxicity and the potential consequences of use.[1]

Legal Issues

LSD and PCP are both included in the *Controlled Drugs and Substances Act*. Possession, trafficking, possession for the purpose of trafficking, possession for the purpose of exporting, production, import and export are all criminal offences that can result in imprisonment for up to three years to life.[2]

As well, the Criminal Code of Canada contains offences related to driving while impaired by alcohol or other drugs. Manitoba has also enacted legislation to address drug-impaired driving.[2]

Risks & Other Harms

According to authoritative data, there are no known deaths directly caused by overdose with LSD, but drug induced confusion has caused accidental deaths.[2]

In addition, abusers who inject the drug expose themselves to other risks, including contracting human immunodeficiency virus (HIV), hepatitis B and C and other blood-borne viruses.

As is the case in any abuse of licit and illicit drugs, there are potential adverse consequences related to the law, a person's financial situation, family relationships, and generally putting oneself at risk by participating in unsafe behaviours while under the influence of the drug.[9]

Pregnancy & Lactation

Studies conducted in the 1970s examining the link between LSD use and spontaneous abortion or fetal abnormalities could not provide solid evidence of a cause-and-effect relationship between LSD use and congenital anomalies. The inconclusiveness of these studies may be in part due to the likelihood that pregnant LSD users are more likely to use other drugs and are exposed to additional risk factors that could also have an adverse effect on pregnancy.[2,3]

PCP is known to cross the placenta in humans and other animals, and it also passes into breast milk. Animal studies found the drug to be teratogenic at very high doses, with abnormalities that include skeletal dysplasias and cleft palate. There are isolated reports of significant birth defects in human babies exposed to the drug in utero. However, later studies showed no overall increased risk of congenital anomalies.[3]

Interventions

If a patient presents with acute psychosis induced by hallucinogen use, the resulting anxiety can usually be controlled with a sedative agent such as diazepam. While antipsychotic agents (i.e. haloperidol) may seem appropriate in these circumstances, they should generally be avoided as they can lead to increased agitation. Just as important as appropriate medication is the need to create an environment that is very calming, with no averse stimuli. Ideally, support and reassurance of friends or family would be helpful while the individual is still affected by the drug.[5]

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Persistent psychosis and HPPD produce symptoms that mimic other neurological disorders and may be difficult to diagnose. While there is no established treatment, some antidepressant drugs may help minimize the symptoms. If the individual is expressing fear over the symptoms, psychotherapy may help with adjustment to the experience.[4]

Any treatment strategy used with those abusing drugs must take into account the specific needs of the individual, as well as the particular substance being abused. This principle is the same for treatment of those who abuse either legal or illegal substances.

Substance Use & Mental Health

- Substance use and mental health problems can often occur together. This is commonly referred to as a co-occurring disorder.
- Substance use may increase the risk of mental health problems.
- People with mental health problems are at higher risk of developing substance abuse problems:
  - Sometimes they use alcohol and other drugs in an attempt to relieve themselves from mental health symptoms.
  - For most people alcohol and other substance use only covers up the symptoms and may make them worse.

Remember: A person's experience with any drug can vary. Here are a few of the many things that may affect the experience: the amount and strength of the drug taken, the setting, a person's mood and expectations before taking the drug, gender, overall health, past experience with that drug and whether more than one drug is being used at the same time. Using alcohol and other drugs at the same time can also be dangerous.

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The Addictions Foundation of Manitoba (AFM) offers a broad range of prevention and treatment services for alcohol, other drugs and gambling. These are designed to meet the needs of all Manitobans and include harm reduction and abstinence-based programs.

For more information, contact your local AFM office or visit our website: www.afm.mb.ca.

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