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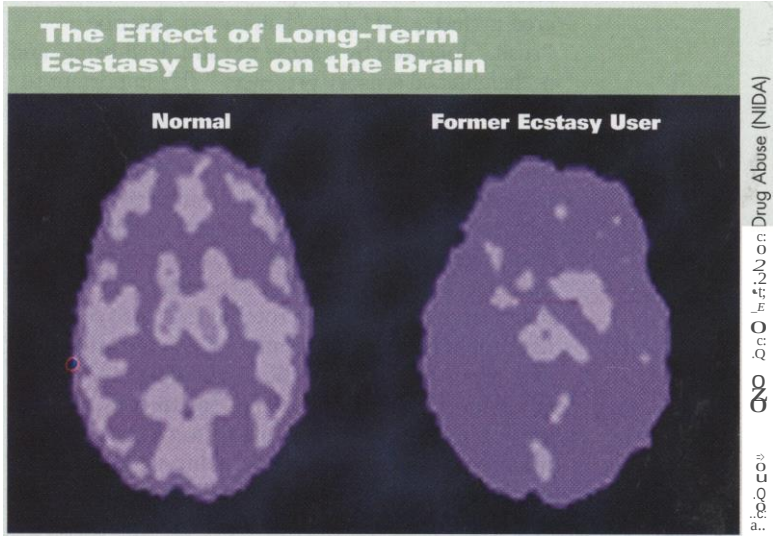
Ecstasy

This designer drug is increasing in popular ity and may be coming soon to an ED near you.

When one thinks of the drugs commonly ssociated with overdose, heroin, ocaine, and alcohol come to mind. However, throughout the United States and around the world, 3,4-methylen edioxymethamphet amine (MDMA), also known as Ecstasy, is becoming the preferred recreational drug among teenagers and young adults. L1 fact, estimates made by the Drug Abuse Warning Network, a data collection system sponsored by the Substance Abuse and Mental Health Services Administration's Office of Applied Studies, reveal that hospital emergency room mentions of Ecstasy rose from 70 in 1993 to 2,850 in 1999.' A 2000 study of Ecstasy use revealed that 3.1% of students in the eighth grade, 5.4% of high school sophomores, and 8.2% of high school seniors reported having either tried or regularly used the drug in the previous year. A 1998 study found that more 18- to 25-year-olds (5%, or 1.4 million) used Ecstasy than did those in any other age group.[2]



Positron emission tomographic scans show that the normal brain, left, has a high density of serotonin reuptake transporters (lavender areas), which remove serotonin from the synapses. At right is the brain of a long-term Ecstasy user (1.5 years). The lavender areas are fewer and smaller, indicating a low density of serotonin reuptake transporters. It's believed that this decrease corresponds to the destruction of serotonin-producing nerve endings.

HISTORY

Sinlilar in its chemical structure to mescaline, amphetamine, and methamphetamine, Ecstasy was first synthesized by a German pharmaceutical firm around 1912 and patented in 1914, possibly as an appetite suppressant, although it was never marketed Y From the 1970s until the mid-1980s, medically supervised use of Ecstasy was popular among some psychotherapists.< It belongs to a group of drugs called entactogens (meaning "touch within"), or hallucinogenic amphetamines, which produce increased emotional awareness, feelings of interpersonal closeness, and introspection, without the unpredictable effects of psychedelics. When used in psychotherapy, Ecstasy has been reported to strengthen the therapeutic alliance by enhancing trust, freeing patients from defensive anxiety, and making them more emotionally open.[5] However, by the mid-1980s, Ecstasy became increasingly popular as a recreational drug, and in 1988 it was classified as a Schedule I controlled substance-a narcotic with a high potential for abuse and no acceptable medical use.[3,4] Possession, delivery, and manufacture of such substances can carry harsh penalties, including fines, of up to $100,000 and prison sentences of up to 99 years or life.<

Street names for Ecstasy include Adam, E, X, XTC, Clarity, Essence, the Stacy, and Eve.< It is found most commonly in tablet or capsule form (a powdered form has also been available) and is ingested orally, although there have been several documented cases involving smoking as well as nasal and rectal routes of administration.'·[2]

Manufactured in makeshift laboratories throughout the world (although prinlarily in the Netherlands and Belgium), it's commonly shipped through express mail services or transported by couriers aboard commercial airliners, although it was recently discovered being sent through the U.S. postal system.' At a wholesa le cost ranging from $8 to $10 per tablet, and an "on the street" cost of $20 to $40, one can see how profitable Ecstasy can be.'·[3] Commonly used in conjunction with other drugs such as methadone, LSD, opiates, or ketamine, Ecstasy is rarely consun1ed with alcoho1 because it's believed that alcohol diminishes its effects. Onset is usually experienced within 20 to 30 minutes of

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ingestion and can last up to 24 hours, with the average "trip" lasting three to four hours.[1,4,5]

WHY DO PEOPLE TAKE ECSTASY?

Known as a "designer drug"-a substance created by underground chemists who alter the molecular structures of existing drugs-Ecstasy is also considered a "feel good" drug. Some users describe a "rush," followed by a sense of calm, well-being, and a "heightened sensory presence."[5] (It's important to note that the contents of tablets or capsules sold as "Ecstasy" have been found to contain substances other than MDMA, ranging from caffeine to dextromethorphan.2) Ecstasy's initial subjective effects, such as elevated mood, congeniality, compassion, and heightened tactile sensation, are thought to occur because the drug causes the release of abnormally large amounts of serotonin into the synapses. (Serotonin is a neurotransmitter that regulates several important brain functions including mood, emotion, sleep, and appetite.) Consequently, more serotonin molecules are available to bind to their receptors, producing increased neuronal firing and heightened subjective effects. Hallucinations are occasionally associated with Ecstasy; however, users claim it doesn't make them feel "trippy," as other psychedelic drugs wouldY It has been called the "lover's speed" because of heightened sexual pleasure; however, the sympathomimetic effects may actually produce erectile dysfunction.[5]

Ecstasy is especially popular in the rave and club scenes because it's said to enable users to remain active in parties that last up to three days. The drug suppresses the need to eat, drink, and sleep, allowing users to endure such marathons. In addition to promoting severe dehydration and exhaustion, suppression of these bodily requirements can cause hyperthermia, reported to be the leading cause of death and disability associated with long-term or high-dose Ecstasy ingestion.[1,2,5,6]

CONSEQUENCES OF TAKING ECSTASY

Acute effects. Dancing for extended periods and lack of hydration may cause Ecstasy users to experience hyperthermic emergencies ranging from heat cramps to heat stroke.[1,2,5,6] Side effects vary according to doses and frequency of use, the drugs taken in combination with Ecstasy, and the contents of the particular form of the drug, and may include nausea, hallucinations, insomnia, profound thirst, chills, diaphoresis, tremors, muscle cramps, jitteriness, involuntary teeth clenching (the reason that many Ecstasy users are seen with pacifiers), hypertension, muscle breakdown, seizures, myocardial infarction, stroke, renal failure, and even sudden death caused by hyperthermic emergencies.[5,6]

The long-term effects of Ecstasy use are still being scientifically evaluated; however, they are thought to be comparable to those found in chronic amphetamine or cocaine use. They include hypertension, tachycardia, depression, paranoia, anxiety, and hallucinations.[2,5,6] Ecstasy is thought to alter or destroy cells in the brain that produce the neurotransmitter serotonin, which plays an important role in the regulation of cognition, emotions, sexual activity, and pain sensations.[1-10] Positron emission tomographic scanning and studies of cerebrospinal fluid have shown that, compared with control brains, brains exposed to Ecstasy contain higher levels of serotonin.[8,11,12] With long-term use, it's believed that the number of serotonin reuptake transporters (they remove serotonin from the synapse) is decreased, a condition related to the destruction of serotonin-producing nerve endings. Specific areas of damage in the brain were the neocortex (the outer part of the brain responsible for conscious thought} and the hippocampus (which plays a key role in the formation and filing of long-term memories)/·[13] Animal studies have demonstrated that four days of exposure to Ecstasy causes brain damage that lasts six to seven years.[2,7] These studies further substantiate the claims that Ecstasy alters the nerve branches, but allows them to regrow abnormally, potentially causing connections to the wrong areas of the brain.[7,9,14]

Functional consequences of the differences in serotonin levels were examined through memory tests. These studies showed that Ecstasy users, even those who had not recently taken it, found it much more difficult to remember what was said or heard during the tests. This impairment was shown to be present for at least two weeks after the most recent drug use.[15,16] Other findings revealed that Ecstasy users were unimpaired in simple tests of mental alertness, but performed worse in more complex tasks involving memory, learning, and general intelligence.[10] Research on the functional consequences of Ecstasy-induced damage of serotonin-

Online Resources

DanceSafe.com
Run by a nonprofit harm reduction organization, the Web site provides comprehensive information on safe use practices, a "parents' section," and an E-Board that provides an enlightening look into club culture and drugs. Go to www.dancesafe.org .

ClubDrugs.org
A resource for up-to-date drug research and information, the site is a service of the National Institute on Drug Abuse. Goto www.clubdrugs.org .

producing neurons in humans is at an early stage. The scientists who conducted the studies cannot say definitively that the harm to brain serotonin neurons accounts for the memory impairments found among chronic users of the drug. However, in the Web site for the drug rehabilitation program, Narconon, Alan Leshner, PhD, director of the National Institute on Drug Abuse, says, "At the very least, people who take MDMA, even just a few times, are risking long-term, perhaps permanent, problems with learning and memory."[9]

EMERGENCY MANAGEMENT

Presentation. Most commonly, patients present with nausea, vomiting, dry mouth, bruxism, muscle aches or stiffness, ataxia, sweating, dilated pupils, and mild hypertension or tachycardia.[5] However, hallucinations, paranoia, nystagmus, hypotension, and seizures have also resulted from Ecstasy use. Acute hyperthermia can cause a decline in the blood's ability to carry and deliver oxygen and the rapid failure of body systems. Disseminated intravascular coagulation, rhabdomyolysis, renal failure, and hepatic failure have also been documented as posthyperthermic complications, even after only one dose of Ecstasy.[5,6]

Treatment. Immediately begin customary rapid cooling measures, such as cooling blankets, gastric lavage with iced saline, and convection evaporation via mist or fans.[6] In addition, neuromuscular blockers (such as vecuronium) and dantrolene, a muscle relaxant (also useful in the management of malignant hyperthermia), may be administered to minimize muscle contractions that may cause additional heat production.[5] As with any critically ill patient, initially address and frequently reevaluate airway, breathing, and circulation during treatment. Initiate intravenous fluids to allow for medication administration, as well as for the treatment of shock and hyperthermia. Hypertension is best treated with nitroprusside and tachyarrhythmias with esmolol. Agitation and seizures are initially managed with the benzodiazepines and long-acting anticonvulsants, as needed.[17]

Don't rule out the possibility of other drugs, or trauma, as the cause of alterations in levels of consciousness. Administering activated charcoal will help with the absorption of drugs. (However, because of the risk of seizures, syrup of ipecac isn't recommended.) Also, because of the possibility that opiates were ingested with the Ecstasy, consider administering naloxone.[5,6]

Monitoring of the heart, as well as of tl1e vital signs, including temperature, should be undertaken for a minimum of six hours.'[7] The diagnostic evaluation of altered level of consciousness, hyperthermja, and end-organ perfusion including electrolytes, blood urea nitrogen, creatinine, liver profile, creatine phosphokinase, urinalysis, and possibly cerebral computed tomographic scanning (if hemorrhage is suspected), as well as urine and blood toxicologic testing should be performed early.

Safety precautions are paramount for the prehospital and nursing staff because patients may initially present quite lethargically and then suddenly become combative, often to the point of requiring sedation. In addition, measures to protect the patient on the stretcher-such as seizure pads and commercial restraints-may be necessary. **T**

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