



# The Emerging MDMA Pandemic



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## Editorial

A new wave of epidemic is emerging that is posing serious mental health risks to people all around the world. This epidemic is caused by a club or party drug 3,4-methylenedioxymethamphetamine (MDMA). MDMA is a psychoactive drug with stimulant and hallucinogenic properties first made in 1912 by the German pharmaceutical company Merck. It was found to improve psychotherapy beginning but later became popular as a street drug in the 1980s [1]. In the year 2017, between 9 and 29 million persons between the ages of 15 and 64 used MDMA i.e. 0.19% to 0.71% of the world population [2]. It is used primarily as a recreational drug associated with the “rave” culture and, as yet, has no accepted medical uses.

MDMA has become widely known as ecstasy (shortened “E”, “X”, or “XTC”), usually referring to its tablet form. The UK term “mandy” and the US term “molly” colloquially refer to MDMA in a crystalline powder form that is thought to be free of adulterants [3]. The experience elicited by MDMA depends on the dose, setting, and user [4]. In psychotherapeutic settings MDMA effects have been described by infantile ideas, alternating phases of mood, sometimes memories and moods connected with childhood experiences [5]. In a quiet environment and when concentrating, it is associated with increased lucidity, capability of concentration, sensitivity of aesthetic aspects of the background and emotions, as well as greater capability of communication with others [6]. The most serious short-term physical health risks of MDMA are hyperthermia and dehydration [7]. Acute toxicity is mainly caused by serotonin syndrome and sympathomimetic effects [8]. Impairments in multiple aspects of cognition, including attention, learning, memory, visual processing, and sleep have been found in regular MDMA users. Long-term exposure to MDMA produces marked neurodegeneration in striatal, hippocampal, prefrontal, and occipital serotonergic axon terminals by several interdependent mechanisms including excitotoxicity, mitochondrial damage and oxidative stress [9,10]. In utero exposure to MDMA is associated with a neuro- and cardiotoxicity and impaired motor functioning. Motor delays may be temporary during infancy or long-term. The severity of these developmental delays increases with heavier MDMA use [11].

Approximately 60% of MDMA users experience withdrawal symptoms when they stop taking MDMA. Some of these symptoms include fatigue, loss of appetite, depression, and trouble concentrating. Tolerance to some of the desired and adverse effects of MDMA is expected to occur with consistent MDMA use. Rarely MDMA abuse can result in death due to hyperthermia, hyponatremia, rhabdomyolysis and cardiovascular collapse [12]. Psychiatric symptoms associated with MDMA include flashbacks, rage, amnesic syndrome, panic attacks, depression, suicidal ideation, paranoid reaction and psychosis. A single dose has been reported to cause persistent psychosis [13]. Research in mice has shown that the developing brain is highly vulnerable to the damaging effects of MDMA and/or alcohol. Mice, exposed to these drugs in a binge pattern during adolescence, show impaired memory and learning in adulthood [14].

MDMA is illegal in most countries [15]. Limited exceptions are sometimes made for research [3]. Researchers are investigating whether a few low doses of MDMA may assist in treating severe, treatment-resistant posttraumatic stress disorder (PTSD) [16]. MDMA produces clinical effects through serotonin (5-HT)1A, 5-HT1B, 5-HT2A, dopamine and alpha-2 receptors, along with oxytocin release, which improves bonding and raises levels of empathy. It enhances the quality of social interactions and thereby improves relationships thereby facilitating psychotherapy. However, it must be emphasized that the medical use involves moderate, infrequent doses of MDMA under medical supervision. In contrast to this, the recreational use involves high and frequent use of the drug, the possibility of adulterants and the concomitant use of other drugs-especially alcohol, cannabis, amphetamine and cocaine [1].

This drug of abuse continues to plague teens and young adults. We need to remain vigilant about patterns and trends of drug abuse. MDMA and the other “club drugs” are not benign. Their effects target the brain, alter neurochemistry, and possibly cause irreversible structural damage. Effective education and timely intervention may prevent these addictive drugs from becoming a way of life, a lifestyle that may have a literal “dead end.”

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