



SUBJECTIVE REPORTS ON THE EFFECTS OF THE MDMA (‘ECSTASY’) EXPERIENCE IN HUMANS

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Abstract

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1. The objective of this paper was to provide an understanding of methylenedioxymethamphetamine (MDMA) use. This investigation provides the subjective effects that were reported by MDMA users.
2. There were a total of (500) humans who participated in this study.
3. Using a survey device, data from users were collected. Symptomatology associated with both the consumption of MDMA and its residual effects are documented.
4. Tables have been constructed to present prevalent psychological and physical side-effects associated with MDMA intake.
5. The results suggest that MDMA has significant implications with various psychological disorders and physical manifestations.

Keywords: ecstasy, effects, humans, methylenedioxymethamphetamine, serotonin.

Abbreviations: Drug Enforcement Administration (DEA), lysergic acid diethylamide (LSD-25), methylenedioxyamphetamine (MDA), methylenedioxymethamphetamine (MDMA).

Introduction

The short-term and long-term effects of methylenedioxymethamphetamine (MDMA) that people endure were investigated. MDMA is commonly referred to by its nickname 'Ecstasy' or just simply 'X'. One hypothesis is that Ecstasy is used primarily for its psychoactive effects of euphoria. MDMA is structurally similar to methylenedioxyamphetamine (MDA), the compound which it is purported to have been derived. MDMA has been popularly classified as being a hallucinogenic amphetamine and has been reported to elicit effects that mimic both lysergic acid diethylamide (LSD-25) and d-amphetamine (McGuire and Fahy, 1991). Historically, MDMA was patented in 1914 to E. Merck in Darmstadt, Germany. Although MDMA is widely believed to have been originally synthesized to be used as an anorectic, the actual patent does not make mention for such use. In the 1970s and 1980s MDMA gained popularity as being an adjunct in counseling sessions. Therapists would administer the drug to their patients in an effort to facilitate the entire therapeutic process.

In the early 1980s, several animal studies suggested that MDMA may cause neurotoxicity. With these findings, the Drug Enforcement Administration (DEA) ordered an emergency hearing regarding the potential risks associated with MDMA intake. Shortly after, MDMA was placed into the most restrictive of all drug categories, Schedule I (Liester et al. 1992). Also, because of its structural similarity to MDA, which had recently been associated with damaging serotonin producing neurons in laboratory animals, the DEA believed that similar destruction could occur in humans, thus possibly evoking long term side-effects (Dowling et al. 1987).

There continues to exist a great deal of uncertainty pertaining to the rapid scheduling of MDMA. It is widely believed that the decision to ban the drug was based purely on animal studies and speculation regarding potential dangers with human use. Despite the scheduling of MDMA, people continue to use this drug throughout the world. Recently, Ecstasy has become associated with the 'rave' movement. At raves, people gather at a particular location under the influence of a specific drug, often Ecstasy, and dance to rhythmic beats and sounds of 'techno' music (Randall, 1992; McDowell, 1993). Numerous reports within the

literature have indicated that Ecstasy use is reaching epidemic proportions and that feelings of euphoria often follow its ingestion.

Although Ecstasy use has been often associated with feelings of well-being, its use has also been implicated with the onset of paranoia, anxiety, insomnia, and flashbacks (Shifano, 1991). This substance has also been reported to elicit acute sympathomimetic effects such as bruxism, trismus, and vomiting in recreational users, and even in a controlled group setting (Greer and Tolbert, 1986). There have been reports that users experience hallucinations, pupillary dilation (Brown and Osterloh, 1987) and many residual effects including blurred vision, headaches, muscle hypertonicity, and depression (Hayner and Mc Kinney, 1986). MDMA has also been tragically linked to deaths in which the clinical course has included hyperthermia, convulsions, disseminated intravascular coagulation, rhabdomyolysis and renal failure (Henry et al. 1992).

Despite the widespread use of MDMA, one study notes that "there is a paucity of research regarding the ways in which Ecstasy is used and the nature of its effects" (Solowij et al. 1992). We investigated the physical and psychological effects that people report after MDMA ingestion. Subjects were found in clubs, cafes, bars, and malls from 3 major cities in the USA. All participants were asked to anonymously complete a questionnaire. The purpose of the questionnaire was to investigate the psychological and physical effects that people experience while under the influence of the drug and residual effects that follow. We provide a thorough review of the reported effects of MDMA in this sample of users. We also discuss the results of the responses in relation to the existing literature.

Methods

Subjects

Five-hundred human subjects (336 male and 164 female) completed the questionnaire. Subjects were mostly Caucasian males and either present or past users of Ecstasy. All participants' ages ranged between 18-25. Most of the participants resided in Virginia, however, there were many volunteers from Texas. Informed consent was obtained from each subject and all ethical guidelines were

strictly adhered. Criterion for participation in this study was to have taken Ecstasy on at least one occasion.

Procedure

Subjects were drawn from shopping malls, nightclubs, and college campuses. After explaining the purpose of the study and obtaining informed consent, subjects were assured of anonymity and asked to complete a questionnaire. While completing the survey, the researcher remained available to each participant for the purpose of clarifying particular questions. Subjects were asked to provide their age, gender, and their frequency of MDMA use. Several questions pertained to psychological and physical sensations that were associated with the MDMA experience. Subjects were also asked to answer questions pertaining to the long term side-effects that they had endured as a consequence of MDMA ingestion. All participants were given the address and phone number of the researcher so that individuals would be able attain the findings of this study. Questionnaires were collected between the Winter of 1992 and the Spring of 1993.

Results

The number of times that subjects had reportedly ingested MDMA ranged from one exposure to over 250 experiences. Over half of the respondents had only a maximum of three exposures to the drug. Subjects reported to have taken MDMA sometime between 1984 and 1993. The most frequently reported year of MDMA use was 1987. All respondents admitted having prior knowledge that the drug is illicit, however, most did not know that MDMA is a Schedule I substance or when the drug became illegal. Participants reported to have experienced a wide range of symptoms while under the influence of Ecstasy (Table 1).

The most commonly reported effects included euphoria, increased energy, sexual arousal, and pupillary dilation. A majority of the users did report that the drug elicited feelings of "love", "happiness", "peace", and "connection". However, there were many effects reported that were not as comforting. Bruxism was a physical side-effect commonly reported by this sample of users. Bruxism was

reported by most users to have been the most disturbing physical side-effect of MDMA use. Some users were forced to seek medical attention as a result of this involuntary reaction. Many also complained of having an intense lower back pain at the onset of ingestion. A substantial amount of the population sample reported to have felt nausea shortly after ingesting Ecstasy. This feeling of nausea had resulted in actual vomiting in some of these users.

Table 1

Immediate Physical and Psychological Effects Reported
by the Sample of 500 Subjects Following MDMA Ingestion

Psychological/Behavioral	% of 500 Subjects
Euphoria	97
Increased Energy	91
Sexual Arousal	83
Paranoia	20
Anxiety	16
Depression	12
Physical	% of 500 Subjects
Pupillary Dilation	88
Bruxism	54
Lower Back Pain	32
Nausea	22

The residual effects of the MDMA experience were also investigated. A table has been employed to display recurring symptomatology that the subjects endured as a consequence of past MDMA use (Table 2). Some of the residual psychological manifestations of Ecstasy use included insomnia, depression, depersonalization, and flashbacks. The physiological side-effects reported included frequent headaches and lower back problems. Subjects explained that

many of these symptoms have continued long after MDMA consumption. Interestingly, many users experienced depression both immediately following the termination of the drug's effects, and months and even years later.

Table 2

Long Term Recurring Psychological and Physical Effects
Attributed to MDMA Use

Psychological/Behavioral	% of 500 Responses
Depersonalization	54
Insomnia	38
Depression	38
Flashbacks	27
Physical	% of 500 Responses
Lower Back Pain	48
Neck Hypertonicity	48
Joint Stiffness	36
Acne/Skin Rash	31
Frequent Headaches	30
Frequent Stomach Cramp	24

Discussion

The findings in this study demonstrate that euphoria is the main reason why people take this particular drug. Other reports have similarly found that Ecstasy is primarily used on a recreational basis for its euphoric effects (Solowij et al. 1992). Although a majority of users have subjectively felt euphoric while under the influence of Ecstasy, findings have also shown that these same users also experience adverse effects both during and long after the drug experience. Many

of these reported effects have been documented in previous studies pertaining to MDMA. These present findings are consistent with other reports in that users experience bruxism, depression, nausea, headaches, insomnia, and flashbacks (Hayner and Mc Kinney, 1986).

Several researchers have found that MDMA causes alterations and sometimes permanent damage to serotonin regulated systems in the brains of experimental animals. We believe that Ecstasy may have altering effects on serotonergic mechanisms in the human brain as well. Many of the adverse effects reported in this study have been well documented in the literature as having originated from abnormal neurotransmission of serotonin in the brain. Alterations in neurotransmitter systems, including brain serotonin, have been commonly associated with the pathophysiology of depression, anxiety, headaches, sleep disorders, anxiety and sexual functioning, and may serve as biochemical pathways for their idiosyncratic manifestation. Several subjects reported to be in psychotherapy and to be taking prescribed medications such as sertraline and fluoxetine to help alleviate symptoms induced by the use of Ecstasy. These medications were reported to be effective in managing side-effects following MDMA use. Some of these cases have been written within the literature. The efficacy of these particular medications further suggests that MDMA has an altering effect on the mechanism responsible for both the release and repackaging of serotonin, especially being that these medications amongst others are known to enhance the neurotransmission of serotonin.

There has been an animal study which suggested that the dose and the number of exposures to MDMA greatly contribute to the neurotoxicity and degeneration of neural serotonin uptake sites (Battaglia et al. 1988). However, we have not found there to be any relation between an individual's number of exposures to MDMA and recurring symptomatology. This would suggest that side-effects attributed to MDMA may be independent of the number of times one has ingested the drug, and that even minimum exposure may elicit adverse symptomatology. The reported effects were all attributed to MDMA use.

Conclusion

The purpose of this investigation was to examine the subjective effects reported by 500 random Ecstasy users. The findings of this study demonstrate that recurring symptoms are commonly attributed to the use of MDMA. With the large number of participants involved in this study, the authors believe that these findings are representative of the MDMA using population. Furthermore, these present data also replicate much of the existing literature regarding the effects that Ecstasy elicits.

The wide range of experiences reported with regard to MDMA consumption are quite relevant, in that they reveal the unpredictable nature of this widely used drug. It is noteworthy that all of the participants in this investigation had taken the drug recreationally, opposed to in a controlled setting. At the present time, these authors recommend extreme caution to those who wish to experiment with this novel drug.

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