

Ecstasy (MDMA) dependence

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Abstract

Methylenedioxymethamphetamine (MDMA) is generally described as non-addictive. However, this report describes three cases in which criteria for dependence were met. A wider understanding that MDMA can be addictive in rare cases is important as very heavy use may cause lasting neuronal changes. This risk could be reduced with effective identification and treatment of dependent persons. In one case dependence was linked with self-medication of post-traumatic stress disorder (PTSD). © 1999 Elsevier Science Ireland Ltd. All rights reserved.

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1. Introduction and methods

Methylenedioxymethamphetamine (MDMA) is described as non-addictive, as was amphetamine itself earlier this century: “there are simply no reports on individuals who take frequent and large amounts of MDMA for an extended period of time” (Peroutka, 1990). However, there are now reports of individuals who have used large quantities for extended periods (McGuire and Fahy, 1991). These reports usually focus on adverse effects and rarely consider dependence as a specific issue. These three cases indicate that MDMA can be addictive in certain cases. Identification and treatment is important as there is some evidence to suggest that high intensity MDMA use may cause lasting changes to serotonergic nerve terminals (Ricuarte et al., 1988; McCann et al., 1996).

2. Results

2.1. Case A

A 19-year-old nightclub promoter (A) was seen 2 weeks after having a seizure, following the use of 20–40 MDMA tablets, and about 1 g/24 h of amphetamine sulphate powder, every week-end for a year. He had first taken MDMA and amphetamine at the age of 17, initially taking one or two pills in the weekend at parties. This pattern remained relatively constant for the first year. At the age of 18, his use of both drugs increased in association with increased income and greater social involvement with clubs and parties. He would take five to ten pills of MDMA in a typical weekend, and about 0.5 g of amphetamine sulphate powder (in total) either wrapped in tissue paper and swallowed, or via the intra-nasal route. The amphetamine was often taken before actually leaving the house to go out for the week-end, while MDMA pills were more likely to be taken when at the venue.

A large increase in the use of both drugs occurred

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when he became employed in nightclub promotion at the age of 18. The usual pattern of use was to commence consumption on Thursday night and to continue in a binge pattern until the early hours of Monday morning, often staying awake almost continuously for much of the period (described as an '80-h weekend'), with attendance at 'breakfast clubs' following nightclubs. The rest of the week was usually spent recovering. His mood would often be quite low by Wednesday. He experienced significant weight loss and often felt very weak.

By the age of 19, he spent almost his entire disposable income on MDMA and amphetamine (oral and intranasal routes only), and was also given large quantities of these and other drugs (cocaine and cannabis) by dealers who wished to gain entry to clubs and other persons who wished to be placed on the guest list. He used about 5 g of cocaine per month. He said that he would use cocaine daily if he had an unlimited supply, but would not buy it. There was little clear division between his employment and recreation. The two activities were largely merged with each other, the drug use being equally involved in both.

Despite the seizure, he was unable to stop using MDMA and amphetamine without external assistance. He described tolerance, and extreme fatigue and low mood after stopping use.

His father was alcohol dependent and described as violent. His father's behaviour created an unpleasant childhood with high anxiety levels. His left school at 16 without qualifications. His relationships with women were shortlived, and there was evidence of a high level of impulsivity. He denied any other criminal, medical or psychiatric history. There was no personal or family history of epilepsy. He smoked cannabis almost daily, sometimes used temazepam to sleep, smoked 20 cigarettes per day, drank about 15 units of alcohol weekly, and very rarely took LSD and other hallucinogens. He had not used heroin.

2.2. Case B

A 30-year-old male (B) gained access to a large supply of pure MDMA powder. For 6 months he injected 250 mg of MDMA, intravenously, up to four times daily neglecting non-drug related activities. He was also injecting heroin and related opioids, and was dependent on benzodiazepines. His general pattern of drug use was to take whatever drugs were available to him, including alcohol, in large quantities. He had a particular preference for the intravenous route regardless of the drug in question. For example, he had injected fluoxetine (Prozac).

He had first taken MDMA 10 years earlier, at the beginning of the English 'rave culture', at the free parties which took place during this period. At that

time, his supplies of MDMA were limited, as were his finances, and he thus took only one to two pills on occasional weekends. He preferred to spend his money on opiates. This remained the usual pattern for at least 8 years, although he would take up to ten MDMA pills in a weekend when the rare opportunity arose to do so without significant financial outlay, as a result of his connections. The dramatic increase in use was directly related to his coming into possession of a substantial quantity of MDMA powder.

He became highly tolerant, and reported that 250 mg taken orally had almost no effect. The highest quantity taken in 24 h was 4 g. The powder was tested and was of a very high purity, with no adulterants. Despite severe depression, he was unable to stop using MDMA although he believed that this was a cause.

His father had schizophrenia and died when he was 12, and his mother was 'very eccentric'. He was an only child, and a loner at school with a strong anti-authoritarian stance. He attended University. For several years in his mid-twenties he was employed as a technician, co-owned a flat with a girlfriend, and went to clubs and parties. However, he was dismissed after a disagreement with his employer, the flat was repossessed, he parted from his girl-friend and he returned to live with his mother. There was a clear history of general constriction of his world and increasing social isolation.

He had been unemployed and without a partner for several years when seen. His few social contacts all arose out of his opiate and benzodiazepine dependence. At that stage, almost all of his drug use, including the injection of MDMA, was carried out when he was alone, in his room upstairs, apart from a few drinks in bars. He had no known medical or psychiatric history and denied that he had ever been arrested. He also used dexamphetamine in occasional binges, cannabis, at least 50 units of alcohol per week (sometimes far more), a range of benzodiazepines and a range of opioids. He had been heroin (or equivalent such as dissolved morphine tablets) and benzodiazepine dependent for at least 3 years. He smoked 20 cigarettes per day. His interpersonal style displayed some disregard for normal social conventions but there was no evidence of psychosis when seen. He denied any psychotic episodes linked to the MDMA use but described brief yet severe paranoid episodes after occasional injection of dexamphetamine.

2.3. Case C

A 25-year-old male electrician (C) with post-traumatic stress disorder (PTSD), characterised by feelings of emotional detachment, took MDMA for the first time and suddenly felt connected with other people again. His use rapidly escalated over several months, use levels being limited by financial considerations.

After 2 years he was taking 25–30 tablets every weekend. His mother confirmed all aspects of the history, and stated that he had sold everything he owned so that he could buy MDMA, alcohol and ‘go clubbing’. He sold his television, video and clothes. He would go without sleep for days at a time, and would not eat. She said: “He was a completely changed person...he sold everything. He would walk out of here with a £90 shirt on and would come home the next day with some-one’s old T-shirt on...” A tested tablet contained MDMA. He also had a very substantial alcohol intake (one bottle of Jack Daniels whiskey almost every night) but did not use other drugs apart from 20 cigarettes per day.

He said that Ecstasy prevented him from becoming drunk. He was uncertain as to whether he experienced alcohol withdrawal symptoms which could be distinguished from the general adverse effects of the night before. The use of alcohol was daily, but the use of MDMA followed a similar pattern to case A, being largely limited to Thursday night until the early hours of Monday morning. Like case A, he also attended ‘breakfast clubs’ following nightclubs. Despite evidence of harm to himself, his use of both MDMA and alcohol continued.

The PTSD followed his being a witness to a combined murder and suicide. He felt guilty that he had not intervened as he believed that he could have done so. After the incident he could not return to work or relate to his girlfriend in a normal way. She left him as a result. He moved back to his parents’ house. He experienced flashbacks of the tragedy, nightmares, emotional blunting, a feeling of detachment from others, loss of the ability to enjoy life, high anxiety, insomnia and suicidal ideas. After spending several weeks in bed he began to drink large quantities of alcohol. One night he was offered MDMA in a club. This was highly effective in removing the emotional blunting and social withdrawal. He denied a previous history of illicit drug use. He said that the Ecstasy was a “whole new world...suddenly everybody cared”. He took increasingly large numbers of tablets: “you take two or three every few hours, just do them like smarties...” He was arrested with 50 tablets in his possession and charged with intent to supply on the basis of quantity, but was found guilty of possession only.

His father was an unemployed tradesman who was formerly alcohol dependent until admitted to hospital with medical complications. These facts were confirmed by external medical sources. As a child, he saw a psychologist because of poor temper control. He left school to become a father at 16. He had two children and then separated from his partner who has custody of the children. He worked as a labourer and subsequently became an electrician. The partner who left him after the murder had been with him for several years. There was no medical or psychiatric history other than that

noted, and he was not prescribed any medication. He had no previous convictions. He was always inclined to worry and had obsessional tendencies. When first seen, he appeared anxious with sweaty palms, restlessness, and a pulse rate of 105. He described being anxious and low in mood with initial insomnia, early morning waking, poor appetite with weight loss, low energy, and anhedonia. He had stopped going out to nightclubs and had frequent suicidal ideas. He expressed extreme guilt about not intervening to prevent the murder/suicide. He was still experiencing nightmares and ‘flashbacks’ of the incident.

3. Discussion and conclusions

A dependence syndrome requires at least three of the following: a strong desire to take the drug; difficulties controlling the behaviour; a withdrawal state; tolerance; progressive neglect of alternative pleasures; and persisting with use despite evidence of harm (World Health Organisation, 1992). These features occurred in all three cases, who considered themselves harmed in various ways, made attempts to stop but yielded to a compelling desire to re-use, and listed fatigue, low mood, anxiety and sleep disturbance as withdrawal phenomena. One case was also amphetamine dependent, one was also dependent on benzodiazepines and opioids with a relatively high regular alcohol intake, and one also had a high daily alcohol intake verging on dependence. The last case also met diagnostic criteria for PTSD, a condition in which excessive use of alcohol and other drugs is a recognised complication (World Health Organisation, 1992).

With repeated, high frequency use, the effects of MDMA may become gradually less empathy—generating and more like amphetamine, although the parameters of this phenomena are still largely anecdotal (Peroutka, 1990; Jansen, 1997). Some users who reach this stage then lose interest in the drug, but as these cases demonstrate, a few users may increase their dose levels, and rare cases may proceed to develop amphetamine-like dependence. The reasons may be that these users seek to regain the initial effects of the drug, that they are attracted to the general stimulant effects which remain, and also the social and psychological factors which increase the risk of dependence with other drugs, such as self-medication of underlying disorders, unresolved personal issues, ready access to the drug and a family history of high levels of drug use (including alcohol). For those who are professionally involved with clubs and dance events, such as promoters and DJ’s, excessive use of psychostimulants may be an occupational hazard.

Possible pharmacological factors are more controversial. Like amphetamine, MDMA can release dopamine,

activating pleasure centres in a manner 'consistent with the action of drugs with dependence liability' (Nichols and Oberlender, 1989). Rhesus monkeys will sometimes engage in repeated self-injection of MDMA (Beardsley et al., 1986; Lamb and Griffiths, 1987). High doses of MDMA can reduce serotonergic function in animals (Ricuarte et al., 1988; McCann et al., 1996), but serotonin reductions appear to increase, not decrease, self-administration of amphetamine-like compounds in some animal studies, although MDMA was not included in these studies (Lyness et al., 1981). The applicability of these animal studies to human situations is unclear, particularly in view of the fact that the large majority of MDMA use is of a non-dependent variety. Nevertheless, it appears that rare cases may develop MDMA dependence with potentially serious consequences. Each of these three cases is in some way exceptional relative to the population of persons who attend weekend dance events, the major context for MDMA use. Identification and treatment of this group, although small, must not be neglected as there may be some risk of nerve terminal damage at these very high levels of use (Ricuarte et al., 1988; McCann et al., 1996).

With respect to treatment, the general principles used to treat MDMA related problems have been discussed elsewhere (Jansen, 1997). The alcohol problem created additional complexity in case B, while in case C the problems of addiction to opiates and benzodiazepines became central although it was the MDMA use which had been the initial reason for this person making contact. All three cases are currently abstinent from MDMA and amphetamines. The heroin user is now injecting prescribed methadone ampoules from a private doctor and uses benzodiazepines sporadically. The person with PTSD has a reduced but still substantial alcohol intake. The nightclub promoter found a daytime job and made substantial lifestyle changes. He continues with near daily cannabis use but no other drugs apart from a moderate alcohol intake. All continue to smoke 20 cigarettes per day.

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