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"Saturday night fever": ecstasy related problems in a London accident and emergency department

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Abstract

***Objectives*—To report on the extent and nature of acute MDMA (ecstasy) related problems presenting to a large London hospital's accident and emergency (A&E) department.**

***Method*—The computerised attendance records for all patients attending the A&E department over a 15 month period were retrospectively screened. Potential cases thus identified had their case notes systematically reviewed to confirm the history of MDMA use and to extract other relevant data.**

***Results*—Forty eight consecutive MDMA related cases were identified. All were in the 15–30 year age group with the majority presenting in the early hours at weekends and having consumed the drug at a night club. The mean number of tablets consumed was two and almost 40% had taken MDMA before. Polydrug use was common with half of the sample having concurrently taken another illicit substance—most commonly other stimulants (amphetamines and cocaine). A wide range of adverse clinical features was found. The most common symptoms were vague and non-specific such as feeling strange or unwell, however many patients had collapsed or lost consciousness. The most common signs elicited were related to sympathetic overactivity, agitation/disturbed behaviour, and increased temperature. The more serious complications of delirium, seizures, and profound unconsciousness (coma) were commoner when MDMA was used in combination with other substances.**

***Conclusions*—For young adults presenting late at night at weekends and exhibiting symptoms of sympathetic overactivity, disturbed behaviour, and increased temperature ("Saturday night fever") the use of stimulant dance drugs especially MDMA should be suspected. As MDMA use does not appear to occur in isolation, the clinical picture is likely to be complicated by multiple rather than single drug ingestion. This poses increased diagnostic and management challenges for A&E staff who typically represent the front line response to dance drug related problems.**

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Keywords: ecstasy; MDMA; substance misuse; drug monitoring

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Ecstasy, the street name for 3,4, methylenedioxymethamphetamine (MDMA) is a modified synthetic amphetamine reported to have both stimulant and hallucinogenic properties.[1] Anecdotal accounts and media reports suggest it is used by up to 500 000 people at weekends in the UK,[2] while scientific surveys have reported that 6–9% of young people have tried MDMA.[3 4] While adverse complications have been described in association with its use,[5 6] the true incidence of these reactions is not known. Ghodse *et al* have demonstrated that accident and emergency (A&E) departments are well placed to provide information about drug misuse,[7 8] a point underscored in a recent Department of Health report,[9] which highlighted the potential of A&E departments in collecting data on illicit drug use. Descriptions in the literature of the adverse effects of MDMA use in humans have to date been provided predominantly by single or small series case reports (for review see Thomasius *et al*[10] and Steele *et al*[11]) or by larger interview surveys of users at a point of time removed from the actual drug experience, for example Peroutka *et al*,[12] Solowij *et al*,[13] and Williamson *et al*.[14] The present study represents a novel large series of consecutive cases of MDMA related problems presenting to a single inner city A&E department. It reports on symptoms described by patients at the time of presentation (that is immediately after the adverse experience) and describes the "at first hand " clinical observations of medical and nursing staff.

Method

Computer records for all attendances at the A&E department of St Thomas' Hospital between 1 January 1995 and 31 March 1996 were retrospectively screened. Data available on computer records included the reason for attendance, patient's sex and date of birth, the time and date of attendance, together with brief computerised nursing and medical discharge summaries. Computer records were searched for potential attendances related to MDMA use by using the following five reasons for attendance recorded by the triage nurse on arrival: any reference to ecstasy, substance misuse/ingestion, intoxication, overdose, or collapse. A pilot study was carried out in which the computer records for two random months (January and December 1995) were screened using a wider variety of reasons for attendance (namely any reference to ecstasy, substance misuse/ingestion, intoxication, overdose or collapse, poisoning, loss of consciousness, chest pain, convulsion, confusion, dehydration, pyrexia, allergic reaction, palpitations, anxiety/

Table 1 Other substances consumed in association with MDMA

Drug	*No (%)*
Amphetamine	12 (52.2)
Cocaine	2 (8.7)
LSD	3 (13.0)
Cannabis	5 (21.7)
GHB	2 (8.7)
Amylnitrate	1 (4.3)
Other	1 (4.3)

GHB = gamma-hydroxybutyrate; LSD = lysergic acid diethylamide.

panic, and psychosis). This list of possible "identifiers" was reached after discussion with A&E staff and from our review of the complications of MDMA use described in the literature. However, the more extended list did not help identify any more cases than did restricting the search to the five reasons for attendance given above.

The A&E department of St Thomas' Hospital serves a resident catchment population of approximately 150 000 but there is in addition a significant non-resident population (commuters, tourists, and homeless people) which is likely to double this figure. During the 15 month period there was a total of 92 950 attendances of which 32 440 were between 15 and 30 years of age. Fifty two potential cases identified from screening computer records then had their clinical notes individually reviewed. As only those cases in which the use of MDMA was felt to be reasonably established (that is either patient or other informant confirmed that MDMA or what was believed to be MDMA had been ingested) were included, four cases were excluded at this stage giving a final study sample of 48 cases. During this period only one patient presented twice. Therefore 47 patients were responsible for 48 separate MDMA related episodes (cases). There were 32 males (one presenting twice) and 15 females, giving a male/female ratio of 2.1:1. Their age ranged between 16 and 30 years (mean 22.9) and 39 (83%) were aged between 16 and 25 years.

For these 48 consecutive cases the following data were then systematically extracted from clinical case notes: time and date of attendance, amount of ecstasy consumed, venue (where consumed), other substances used, clinical details, and brief data on management and disposal.

Results

WHEN AND WHERE? (TIME OF PRESENTATION AND VENUE)

The most common day of the week for presentation was Sunday (26; 54.2%), with the weekend (Saturday/Sunday) accounting for 32 cases (66.7%). The most common time of presentation was between 10 pm and 9 am (45; 93.8%). Almost half (22; 46%) of all episodes occurred on Saturday night/Sunday morning between the hours of 10 pm and 9 am.

More than half (27; 56.1%) reported that they had used the drug while attending a night club or rave party, two (4.2%) while at home, one (2.1%) in a (unspecified) public place, and the venue was not recorded in 18 (37.5%) cases.

HOW MUCH AND HOW OFTEN? (AMOUNT CONSUMED AND PREVIOUS USE)

The amount of MDMA reported to have been consumed ranged from half to eight tablets (median two). The majority (36; 75%) consumed between a half to two tablets and the amount consumed was not recorded in three (6.3%) cases. In nine cases (18.8%) three or more tablets were taken. Nineteen patients (39.6%) had taken MDMA before, nine (18.8%) had not, and data were not recorded in 20 (41.7%) cases.

ALONE OR IN COMBINATION? (OTHER DRUGS AND ALCOHOL)

In 16 (33.3%) cases MDMA was the only substance used before the index episode/presentation. In eight (16.7%) cases alcohol was also consumed while other illicit drug(s) were used with MDMA in 15 (31.3%) cases. A combination of MDMA, alcohol, and another drug(s) were reported in nine (18.8%) cases. Another illicit substance was therefore used in combination with MDMA in half the episodes (15+9 = 24, 50%). These other drugs, among which stimulants (amphetamine and cocaine) predominate, are shown in table 1.

CLINICAL FEATURES (SYMPTOMS AND SIGNS)

A wide diversity of adverse clinical effects was found. For ease of presentation similar or

Table 2 Clinical features associated with MDMA use (n=48)

Complaint/symptom	*No (%)*	*Clinical findings/sign*	*No (%)*
Strange/unwell/dizzy/weak	15 (31.3)	High pulse rate (> 100 beats/min)	32 (66.6)
Collapsed/loss of consciousness	11 (22.9)	Dilated pupils	18 (37.5)
Nausea or vomiting	11 (22.9)	Hyperventilation (> 20 breaths/min)	10 (20.8)
Panic/anxiety/restlessness	11 (22.9)	Anxiety/agitation/disturbed behaviour	10 (20.8)
Palpitations	10 (20.8)	High temperature (> 37.1°C)	9 (18.8)
Hot/cold (feeling feverish/shivering)	7 (14.6)	High blood pressure (> 160/95 mm Hg)	6 (12.5)
Sweating	6 (12.5)	Drowsiness	3 (6.3)
Shaking	6 (12.5)	Dehydration	2 (4.2)
Headache	6 (12.5)	Shivering	2 (4.2)
Chest pain	4 (8.3)	Seizure	2 (4.2)
Difficulty breathing	4 (8.3)	Nystagmus	2 (4.2)
Abdominal pain	4 (8.3)	Confusion	2 (4.2)
Muscle aches/pains	4 (8.3)	Hallucinating	1 (2.1)
Visual disturbance	3 (6.3)	Sweating	1 (2.1)
Thirst	3 (6.3)	Unconscious	1 (2.1)
Seizure	3 (6.3)	Tremulousness	1 (2.1)
Twitching	1 (2.1)	No abnormality found	3 (6.3)
Other	5 (10.4)	Other	6 (12.5)

Sum of percentages exceed 100% as patients may have more than one complaint/finding.

Table 3 Clinical features associated with MDMA only (n=16)

Complaint/symptom	*No (%)*	*Clinical findings/sign*	*No (%)*
Strange/unwell/dizzy/weak	7 (43.8)	High pulse rate (> 100 beats/min)	13 (81.3)
Collapsed/loss of consciousness	1 (6.3)	Dilated pupils	6 (37.5)
Nausea or vomiting	5 (31.3)	Hyperventilation (> 20 breaths/min)	6 (37.5)
Panic/anxiety/restlessness	5 (31.3)	Anxiety/agitation/disturbed behaviour	4 (25)
Palpitations	6 (37.5)	High temperature (> 37.1°C)	5 (31.5)
Hot/cold (feeling feverish/shivering)	4 (25.0)	High blood pressure (> 160/95 mm Hg)	0
Sweating	3 (18.8)	Drowsiness	0
Shaking	2 (12.5)	Dehydration	1 (6.3)
Headache	2 (12.5)	Shivering	1 (6.3)
Chest pain	1 (6.3)	Seizure	0
Difficulty breathing	2 (12.5)	Nystagmus	2 (12.5)
Abdominal pain	3 (18.8)	Hallucinating	0
Muscle aches/pains	1 (6.3)	Sweating	1 (6.3)
Visual disturbance	2 (12.5)	Unconscious	0
Thirst	2 (12.5)	Tremulousness	0
Seizure	0	No abnormality found	0
Twitching	0	Other	3 (18.8)
Other	4 (25.0)		

Sum of percentages exceed 100% as patients may have more than one complaint/finding.

related features (symptoms and signs) have been grouped together and are shown in the order of frequency of occurrence in table 2.

The most commonly reported symptom group included non-specific complaints such as: feeling strange, unwell, dizzy, or weak (15; 31.3%). The next most common complaints were collapse or loss of consciousness (11; 22.9%), nausea/vomiting (11; 22.9%), and palpitations (10; 20.8%). Psychiatric symptoms such as anxiety, panic, and restlessness were also frequently reported (11, 22.9%). In 17 cases (35%) at least two out of these five complaints were reported. Symptoms possibly related to temperature control (for example feeling excessively hot, cold, feverish, or shivering) occurred in seven (15%) cases.

On clinical examination the most commonly elicited signs included increased pulse rate (32; 66.6%), dilated pupils (18; 37.5%), tachypnoea (10; 20.8%), and raised body temperature (nine; 18.8%). Anxiety, agitation, or disturbed behaviour was also commonly found (10; 20.8%). In 12 cases (25.0%) at least three out of these five clinical signs were elicited at presentation.

By classifying adverse effects as mild, moderate, or severe according to the scheme adopted by the National Poisons Information Service,[15] we found that only in six episodes were they severe. These more serious complications included delirium (confusion/disorientation) in two cases, seizures in three cases, and profound unconsciousness (coma) in one case. No abnormal clinical findings were elicited in three cases. In one case certain clinical features (namely testicular pain and scrotal swelling) were deemed coincidental with rather than as a direct consequence of MDMA use.

In view of the fact that two thirds (n=32/48) of the sample reported concurrent consumption of either other illicit drug(s) and/or alcohol, we separated out those cases (n=16/48) where only MDMA use was reported (tables 3 and 4). Symptom reports were similar in both groups except that complaints of collapse or loss of consciousness were less frequent in the MDMA only group (6.3% *v* 31.1%). With regard to clinical signs, hyperventilation (37.5% *v* 12.5%) and increased temperature (31.5% *v* 12.5%) were more common, and increased blood pressure (0% *v* 18.8%) less common in those using MDMA only, otherwise there was little to distinguish the two subgroups. Numbers were too small to allow any meaningful statistical comparisons. The more serious complications, however, occurred exclusively in the polydrug group.

MANAGEMENT AND DISPOSAL (TABLE 5)

After initial assessment, 41 (85.4%) cases had an electrocardiogram or continuous cardiac monitoring. In 30 cases (62.5%) the patient received a further period of observation and

Table 4 Clinical features associated with MDMA and other drugs and/or alcohol (n=32)

Complaint/symptom	*No (%)*	*Clinical findings/sign*	*No (%)*
Strange/unwell/dizzy/weak	8 (25.0)	High pulse rate (> 100 beats/min)	19 (59.4)
Collapsed/loss of consciousness	10 (31.1)	Dilated pupils	12 (37.5)
Nausea or vomiting	6 (18.8)	Hyperventilation (> 20 breaths/min)	4 (12.5)
Panic/anxiety/restlessness	4 (12.5)	Anxiety/agitation/disturbed behaviour	6 (18.8)
Palpitations	6 (18.8)	High temperature (> 37.1°C)	4 (12.5)
Hot/cold (feeling feverish/shivering)	3 (9.4)	High blood pressure (> 160/95 mm Hg)	6 (18.8)
Sweating	3 (9.4)	Drowsiness	3 (9.4)
Shaking	4 (12.5)	Dehydration	1 (3.1)
Headache	4 (12.5)	Shivering	1 (3.1)
Chest pain	3 (9.4)	Seizure	2 (6.3)
Difficulty breathing	2 (6.3)	Nystagmus	0
Abdominal pain	1 (3.1)	Hallucinating	1 (3.1)
Muscle aches/pains	3 (9.4)	Sweating	0
Visual disturbance	1 (3.1)	Unconscious	1 (3.1)
Thirst	1 (3.1)	Tremulousness	1 (3.1)
Seizure	3 (9.4)	No abnormality found	3 (9.4)
Twitching	1 (3.1)	Other	6 (18.8)
Other	3 (9.4)	Missing data	1 (3.1)

Sum of percentages exceed 100% as patients may have more than one complaint/finding.

Table 5 Management and disposal of MDMA related episodes (n=48)

Management	*No (%)*	*Disposal*	*No (%)*
ECG/cardiac monitoring	41 (85.4)	Discharged home immediately	8 (16.7)
Observed in A&E	30 (62.5)	Discharged home after observation/monitoring	20 (41.7)
Advice/reassurance	14 (29.2)	Own discharge/refused treatment	10 (20.8)
Oral fluids/IV fluids	8/7 (31.3)	Admitted to hospital ward	7 (14.6)
Medication given	6 (12.5)	Referred to specialist service	5 (10.4)
Resuscitation/intubation	1 (2.1)		

Sum of percentages exceeds 100% as patients may have received more than one form of management/disposal.
ECG = electrocardiography; IV = intravenous.

monitoring (mean 9 hours, range 1–12 hours) in the A&E department. Fifteen cases (31.3%) received fluids (oral eight/intravenous seven) while six (12.5%) had some form of medication administered (diazepam, two, and one each naloxone, activated charcoal, metoclopramide, and antibiotics/paracetamol). Advice/reassurance was recorded as having been given in 14 (29.%) cases. Full resuscitation and intubation were required in one case.

With regard to disposal, eight (16.7%) cases were discharged home immediately after initial clinical assessment. A further 20 (41.7%) were discharged home after a period of observation and clinical monitoring. In 10 (20.8%) episodes patients took their own discharge prematurely against medical advice. Seven cases (14.6%) required hospital admission of which only one patient had used MDMA alone, the remainder having taken another illicit drug(s) and/or alcohol in addition to MDMA. Onward referral to specialist outpatient services occurred in five cases but none of these were to drug agencies.

Discussion

Ecstasy related problems were not common among our A&E patients, with only 48 attendances over 15 months associated with MDMA use among a 32 440 total attendance in the 15 to 30 year group. This finding may however represent an underestimate given the large volume of records initially screened and the possibility of concealment of illicit drug use by some patients. Moreover it is probable that some of those experiencing side effects may not have presented for help. Indeed, a recent comparable study of stimulant users in the London area found that a large proportion of morbidity (adverse effects) passed unnoticed and untreated by health care agencies.[14]

All subjects were aged between 15 and 30 years, and the most popular venue for consumption of MDMA was a rave or night club. This confirms what is already reported about MDMA use in the UK, namely it is most commonly used by young people recreationally in association with the dance/club scene.[1] The time of presentation however, with the vast majority of cases presenting over the weekend and especially on Saturday night or early Sunday morning, should serve to alert A&E staff to the increased likelihood of MDMA and other dance drug related cases at these times. Williamson *et al* have reported that among MDMA users the majority (77%) of bad experiences with the drug occurred at night clubs.[14] The high percentage (56%) of night clubbers within our sample concurs with their findings and adds further support to the contention that adverse affects may occur more readily when the drug (MDMA) is used while engaging in rigorous physical exertion (dancing) within a potentially hazardous (hot and crowded) environment.[5 16] In almost two out of five cases MDMA had been used before, suggesting that prior (uncomplicated) use does not necessarily predict future problem-free use, a point that needs to be reinforced in health promotion and drug awareness/educational material.

Since the mid-1980s there have been approximately 50 case reports of various psychiatric complications and an even larger number of case reports concerned with medical sequelae which have been reviewed by Thomasius *et al.*[10] While we discovered a wide diversity of adverse clinical effects, little in the way of new clinical features not previously described in the literature was encountered. However, our larger number of consecutive cases allowed us to pool data and describe both the nature and frequency of occurrence of the various individual clinical features. Thus we would contend that, in the case of young adults presenting late at night, especially at weekends, having collapsed or complaining of feeling strange and exhibiting symptoms of sympathetic overactivity, disturbed behaviour, and increased temperature ("Saturday night fever"), the use of stimulant dance drugs especially MDMA should always be suspected and considered in the differential diagnosis.

Our findings also bear witness to the growing phenomenon of polydrug use.[4] MDMA was not used in isolation, as half of our sample had consumed other illicit substance concurrently. The most popular choice was other stimulants—amphetamines and cocaine. Furthermore the more serious complications (delirium, seizures, and coma) occurred in the subgroup of MDMA users who had also taken other illicit drug(s) and/or alcohol. This suggests, not surprisingly, that multiple substance use may be associated with an increased risk of developing serious side effects. In the later case of deep coma, the patient had consumed a particularly dangerous cocktail of MDMA and gamma-hydroxybutyrate.[17] The use of a combination of drugs also imposes limitations on the interpretation of our results and makes attribution of clinical findings to one particular substance (MDMA) questionable. However this is the clinical reality or the "medicine based evidence"[18] of how these young patients present. It highlights the need to consider multiple drug ingestion in patients reporting MDMA use and that their clinical presentation may reflect a complex interaction

of the simultaneous effects of different substances.

The majority of MDMA related episodes seem to have been managed effectively in the A&E department and most patients were safely discharged home after a variable period of time. In most cases minimal interventions (cardiac monitoring, clinical observation, and reassurance) were all that was necessary. Indeed 17% were discharged immediately after initial assessment. This is not to minimise the potential for more serious complications which can occur with this drug.[5] Fluids were administered in almost a third of cases, probably reflecting concerns about dehydration and thermoregulatory problems known to occur in association with MDMA. Furthermore, admission was deemed necessary for seven individuals and one patient required full resuscitation in the A&E department. The one in five patients refused treatment is worrying with no further information available as to how these patients fared. Although advice, presumably about the dangers of drug use, was recorded to have been given in 29% of cases, referral to or provision of information on specific drug agencies was rare.

Our subgroup of MDMA users who presented to an A&E department with drug related problems cannot, of course, easily be generalised to the greater population of MDMA users who may or may not use this drug without complication. However, in a large community sample of stimulant users it was reported that up to a fifth did experience an adverse experience with MDMA.[15] The retrospective nature of our study meant reliance on data recorded in medical and nursing notes. Nevertheless we found a high level of consistency in data recording and much information was collected in a standard fashion (for example medical history taking and description of clinical findings). An additional limitation was that drug use was not confirmed by urine toxicology. Although routine urinalysis in A&E departments has been proposed by some authors,[19] results are unlikely to influence the acute management given the time delay involved.

In conclusion, A&E departments can provide a unique opportunity to monitor, manage, and perhaps prevent substance misuse problems. For young adults presenting late at night at weekends and exhibiting symptoms of sympathetic overactivity, disturbed behaviour, and increased temperature ("Saturday night fever") the use of stimulant dance drugs especially MDMA should be suspected. As MDMA use does not appear to occur in isolation, the clinical picture is likely to be complicated by multiple rather than single drug ingestion. This poses increased diagnostic and management challenges for A&E staff who typically represent the front line response to dance drug related problems.

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