Management of drug abuse emergencies

The doctor in the accident and emergency (A&E) department can be confronted with a wide range of acute situations requiring urgent management, and this is particularly true when considering drug and substance abuse, which has a high prevalence of acute physical morbidity. The range of medical problems presenting for diagnosis or urgent management includes acute intoxication leading to cardiac or respiratory complications, acute behavioural disturbances, the secondary effects of trauma, infection or rhabdomyolysis, and the recognition and management of drug seeking behaviour. This article briefly reviews the presentation and management of drug abuse emergencies as they can occur in an accident and emergency department.

The drug and the diagnosis

Behavioural disturbances, clinical signs, or biochemical abnormalities may suggest that the patient is suffering from the complications of illicit drug use. Injection marks, syringes, powders, or tablets are a strong pointer. Where the patient or friends provide a history, or where the physical signs and circumstances indicate drugs as the cause of the patient’s problem, a working diagnosis can be made immediately, bearing in mind that the contents and concentrations of illicit drugs vary markedly. For example, street heroin may range between 10% and 80% pure, while amphetamine sulphate is usually 2-5% pure, though stronger varieties with around 20% purity are also on sale. Cocaine hydrochloride is usually about 20-80% pure, and “crack” crystals are often 80-90% pure cocaine base. LSD squares or microdots contain about 30-150 μg of LSD (and the duration and intensity of effects may vary accordingly). Substances sold as ecstasy usually containMDMA or similar drugs, but fraudulent dealers may sell binary mixtures of, for example, ephedrine and LSD in order to recreate some of the effects that MDMA might produce, while in some cases the preparation sold contains no active ingredients at all. “Herbal” substances are also marketed, but ecstasy substitutes tend to have less toxicity than the drug itself. Some other drugs are not a common cause of emergency presentations in Europe. Phencyclidine can cause agitation, hallucinations, violence, and hyperthermia, but is rarely found in Britain. Cannabis is now extremely widely used but does not usually cause medical complications unless use is heavy enough to lead to psychosis; over-dosage can cause a hallucinatory state.

Analytical confirmation of suspected substances or samples of biological fluids is not usually feasible in the short term, though it is frequently helpful to confirm retrospectively the cause of a clinical problem. Where brain damage has occurred against a background of drug or substance abuse, toxicological analyses are usually indicated. Urine is the best medium for testing for the presence of a drug, and a positive result can usually be found for 36-48 hours after exposure (an exception is cannabis, which may be detected in urine up to three weeks after use). Measurement of blood concentrations can be carried out on lithium heparin plasma samples (fluoride oxalate tubes are preferred for measurement of cocaine or ethanol).

Stuffers and packers

“Body stuffers” are individuals who swallow drugs which are in their possession in order to avoid being apprehended in possession of them. The drugs are usually poorly wrapped, if at all, and the onset of symptoms tends to be within two hours. In these cases the police will usually be heavily involved from the beginning, and may press for diagnostic details or for samples to be taken. In cases such as this the clinical care of the patient comes first, and although the police should be allowed to maintain a guard over their detainee, minute by minute bulletins on the patient’s clinical situation are not in anybody’s interest.

“Body packers” are those who swallow or insert into body orifices carefully sealed packets of illicit drugs in order to avoid detection by customs officers at national borders. If the packets leak, these people tend to present with an acute illness and a history of air travel, though cross channel rail travel and ferries also see their share of illicit drug smuggling. In these cases, a relatively small leak from one of a number of packets may be enough to cause life threatening symptoms, and urgent management is required to stabilise the patient’s clinical condition and prevent progression of toxicity. Endoscopic removal may be indicated for packets in the stomach, while whole gut ravage, though rarely performed in accident and emergency departments, is generally considered as the most appropriate method for rapidly progressing the packets through the intestine,12 provided the patient does not have ileus. Surgical removal is best avoided but may occasionally be necessary.3

Opioids

Opioid toxicity produces the classical triad of reduced consciousness, pinpoint pupils, and slowing of respiration. These should be enough to lead to a rapid working diagnosis of opioid toxicity, and naloxone (initial dose 0.8-2 mg as an intravenous bolus) can be used as a diagnostic and therapeutic trial. A partial response is an indication for a further dose, though the patient may be sedated by another central nervous system agent, such as alcohol or a benzodiazepine, or may already have suffered a degree of hypoxic cerebral damage, in which case the pupils would be expected to be dilated. The possibility that the patient may be an addict, and that naloxone might precipitate withdrawal symptoms should not be considered a contraindication to its use. Opioid toxicity is life threatening, but opioid withdrawal does not kill. Clearly, with opioid toxicity, the first priority is to ensure that respiration and circulation are adequate, and if the patient appears to be close to respiratory arrest, attention to the airway and provision of respiratory and cardiovascular support is more urgent than giving naloxone. Once the patient’s condition is under control and a response to naloxone has been seen, it may be worth setting up an infusion of naloxone at a suitable dose in order to prevent the patient from deteriorating. Naloxone usually has low toxicity and few complications, but one prospective review of 453 cases where it was given found a 1.3% incidence of serious complications (one subject had asystole, three had convulsions, one had pulmonary oedema, and one had immediate violent behaviour).4 Other problems seen with opioid toxicity include pulmonary aspiration, pulmonary oedema (rare, though commonly mentioned in textbooks), and non-traumatic rhabdomyolysis or compartment syndromes.
Benzodiazepines
Temazepam is widely abused, and is sometimes injected. Ischaemic complications from accidental intra-arterial injection are less commonly seen because of changes in formulation. Although flumazenil is not licensed in Britain for the reversal of benzodiazepine toxicity because of the possibility of precipitating convulsions in, for example, a patient who has taken benzodiazepines together with tricyclic antidepressants, flumazenil can be useful in a manner analogous to the use of naloxone as a diagnostic and sometimes as a therapeutic tool. However, there is a distinct chance of precipitating convulsions if the clinical features are not typical. In one series, convulsions occurred in five out of 26 such cases.

Cocaine
Cocaine may be taken by inhalation or by intravenous injection, and crack cocaine is smoked, leading to the additional complications of black sputum, chest pain from tracheal irritation, and lung damage. The effects produced are based on the pharmacological properties of cocaine. In the central nervous system, cocaine blocks the reuptake of the neurotransmitters noradrenaline, serotonin, and dopamine. This is responsible for the agitation, confusion, paranoia and aggression which may occur in the cocaine user.

There are frequently marked cardiovascular effects with tachycardia, hypertension, chest pain, and sometimes ischaemic changes on the electrocardiograph. Syncope, coma, and convulsions may occur. Repeated cocaine use can lead to vasculitis. There may be cerebral, renal, or cardiac vasculitis, and in cocaine sniffer, the nasal vessels develop vasculitis. Cocaine is associated with an increased incidence of myocardial infarction related to the extreme stress on the cardiovascular system produced by hypertension, plus possible coronary vasculitis and also accelerated atheroma, which has been reported in the United States. A further property of cocaine is its local anaesthetic effect, which in overdose depresses myocardial contractility. This can lead to a profound fall in cardiac output and is quite often the cause of death in cases of overdose.

Although the pathology and symptomatology, caused by cocaine may be complicated, the management is relatively straightforward. There is no direct antidote for cocaine toxicity, but it is now accepted that diazepam will antagonise the central stimulant and hypertensive effects of the drug, so that high dose intravenous diazepam is the most appropriate first line treatment. Nitroprusside should be used for severe hypertension. Calcium antagonists should be used for ischaemic pain or electrocardiographic changes. Antiarrhythmic drugs (but not negatively inotropic ones) should be used for cardiac arrhythmias; β-blockade with atenolol or esmolol should be considered.

LSD
LSD (lysergic acid diethylamide) is widely available, usually as small printed paper squares, and is taken orally. It produces a hallucinogenic state and sometimes extreme agitation and violence. There are now occasional reports from dilated pupils, piloerection, tachycardia, and hypertension following high doses. Physical restraint may be required to prevent the patient injuring himself or attendants. Sedation with haloperidol may be appropriate, but in the first instance the patient should be kept in a quiet atmosphere with dim lighting. Deaths from direct toxicity are virtually unknown, but death may result from accidents or violence while under the influence of the drug.

Amphetamine
Amphetamine sulphate is widely used as a stimulant, and produces a euphoriant effect. The patient may be talkative, excitable, and confident, but may be paranoid or hallucinating, particularly in the long term heavy user. The most important effects are on the cardiovascular system, and there may be marked hypertension and tachycardia. Gastrointestinal accidents occur. Hyperthermia, rhabdomyolysis, and acute renal failure have been reported with some regularity over the years, but are now more commonly associated with ecstasy use. Management of cardiac arrhythmias includes the use of β blockade with atenolol or esmolol.

Ecstasy
Several drugs are marketed as ecstasy. They are usually amphetamine derivatives (MDMA, 3,4-methylenedioxymethylamphetamine; MDA, 3,4-methylenedioxyamphetamine; MDEA, 3,4-methylenedioxymethylamphetamine; and MBDB, methyl-benzodioxolbutanimine). The effects of these drugs tend to be similar and the major problems encountered will be described. MDMA was widely used in the United States in the 1980s, but there were few reports of serious toxicity. In Britain, the drug has tended to be used as a dance drug at parties and “raves”. This has led to a number of cases of severe and fatal hyperthermia. Subsequently, reports began to appear of hyponatraemia caused by excessive fluid ingestion compounded by failure of renal water elimination, due to inappropriate secretion of antidiuretic hormone; these cases were in some measure a result of harm limitation messages, encouraging drug users to drink fluid to prevent hyperthermic complications.

The hyperthermic patient usually presents with collapse or convulsions plus a history of ecstasy ingestion (and sometimes of amphetamine ingestion) accompanied by continuous dancing for several hours. Examination shows dilated pupils, sweating (though in severe cases this may have ceased), a marked sinus tachycardia (rates of 140-160 beats per minute are not uncommon), hypotension, and a core temperature of 39-42°C. Cases such as this represent an acute medical emergency. Once a high core temperature has been confirmed, one litre of 0.9% saline should be given immediately, without delaying to measure central pressure. If this brings down the pulse rate and raises the blood pressure, a further litre can be given, after which the central pressure should be measured and further fluids given as required. Control of convulsions can usually be achieved with diazepam. One important feature about these cases is that dantrolene reduces the calcium requirement for excitation contraction coupling, and once the patient has developed hyperthermia, further heat production may occur. This should be prevented by administration of dantrolene, which is indicated if the core temperature is above 39°C. Dantrolene acts as a calcium antagonist, at a cellular and subcellular level, but its use should not take precedence over facilitating thermoregulation by restoring fluid volume.

Another problem seen in ecstasy users is acute hyponatraemia with mute states, headache, and vomiting, secondary to excessive fluid ingestion. Severe symptoms may develop with a plasma sodium of 130 mmol/litre or below, and the urine is inappropriately concentrated with a raised osmolality, due to excessive production of arginine vasopressin. In most cases supportive management is sufficient, but in severe cases intravenous mannitol, diuretics, or hypertonic saline may be required.

Other problems which occur in ecstasy users are acute renal failure due to rhabdomyolysis, hepatitis, cerebrovascular accidents, and acute psychiatric disturbances. The incidence of long term psychiatric complications is unknown, though there is a definite incidence of psychiatric illness.

Conclusion
The rise in illicit drug abuse has seen an accompanying increase in the incidence of medical complications. The range of substances used as dance drugs means that junior
medical staff need to have a grasp of the drugs used and their pharmacology. Resuscitation and immediate management in the accident and emergency department can be critically important in preventing complications and ensuring a successful outcome. An understanding of the toxic mechanisms involved can enable one to employ a more rational approach to the clinical management of the acutely ill drug abuser.

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14 Holden R Jackson MA. Near-fatal hyponatraemia coma due to vasopressin oversecretion after “ecstasy” (3,4-MDMA). Lancet 1996;347:1052.

Management issues in accident and emergency medicine

Management is a part of the job of any consultant in the NHS, but for accident and emergency (A&E) consultants it is a crucial, often dominant, and generally stressful part of their work. It is also extremely time consuming. A leading consultant in the early eighties publicly stated that management issues occupied 80% of his working week, and although the situation may have changed somewhat with the advent of multiconsultant departments, it remains as important as ever to deal with these issues as effectively and as efficiently as possible so that there is time for the consultant to maintain a visible presence in the department, teach the junior staff, and conduct research and audit.

To the uninitiated, the term “management” conjures up an unappealing vista of boring committee meetings, intrusive administrators, and accountants demanding improved performance and diminishing expenditure. As with most caricatures, there are elements of truth within this view, but management is really much more than this. It is, in the words of John Harvey Jones, about “making things happen”, and this entails learning how to deal effectively with people. Within the A&E department, this involves forming, leading, and nurturing an effective clinical team. Junior medical staff need to be selected, trained, and assessed, and positive and effective relationships with our nursing colleagues and others working in the department need to be forged and maintained so that a “them and us” situation does not develop.

Relationships with those outside the department are equally important. The way duty teams behave in the department and the support they provide to our junior staff need continuous examination, sometimes involving difficult negotiations with consultant colleagues. Local general practitioners, often neglected in the past by A&E staff, quite naturally expect more and better information about their patients’ attendances at A&E departments. Many newsworthy events tend to occur in A&E departments and local news media are likely to pay a periodic interest in activities there and request interviews with staff involved.

A&E is surrounded by a morass of legal issues which may prove particularly daunting for the newly appointed consultant. Relationships with the police and the nature and quantity of patient information that may be released to them are frequent problems in A&E, and a variety of legal and ethical dilemmas regularly confronts the A&E consultant. Handling claims of clinical negligence and the avoidance of these by clinical risk management are also important and time consuming parts of the consultant’s duties.

The A&E clinical team will not function effectively unless it is provided with the facilities to do so. The fabric and maintenance of the department must be attended to, as the updating of equipment and the purchasing of new equipment for changing clinical needs. Provision of a safe working environment is a particular issue in most A&E departments as the incidence of verbal and physical assault on staff increases.

Given the enormous variety and significance of issues such as these, it is scarcely surprising that newly appointed A&E consultants find management the most challenging part of their work. Trainees rightly expect that they should receive proper training in this important area of their future activities, and this demand led to my organisation of the first management course specifically for A&E trainees in 1988. Since then, various other initiatives have begun, and the demand for the original course (run on a two yearly basis) has grown to the point where it appears that it will need to be run annually. The importance of management in A&E has recently been recognised by the Faculty of Accident and Emergency Medicine, which includes management problems in its exit examinations.

Training people in management is complex; there are frequently no “right” or “wrong” answers, and the correct methods of dealing with difficult situations are generally derived from shared experience rather than from textbooks or direct instruction. The series on “Management issues in accident and emergency” that starts with this issue of the Journal is thus warmly to be welcomed. Not only will it serve to reinforce management training already in progress, but it should also provide a forum for the experience of established consultants to be shared. It is to be hoped that the opinions expressed in the series generate some lively correspondence.

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