Chapter 1
INTRODUCTION

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Amphetamine-type substances (ATS) are the second most commonly used drugs in the world (UNODC, 2007). Their use occurs across Europe, North America, Asia and Australasia, and in many places the use of these drugs can be problematic. The chapters in this book describe the nature of this drug, the effects of the drug and patterns of use in various parts of the world. Despite the widespread use of the drug and the problems that it may cause, there seems to be little consensus on effective treatment. One of the aims of this book is to review this international evidence and try to draw together examples of good practice. Opiates such as heroin and morphine are drugs which cause problems in many parts of the world, and there is now a widespread consensus on how effective treatment can be managed, usually by using substitute medication such as methadone. There is no similar pharmacological answer for the amphetamine group of drugs as yet, despite the magnitude of the problems they cause. Whether this is because there is no similar option for amphetamines compared to heroin or because the impetus to develop pharmacological treatments has not been seen to be of sufficient importance is open to debate.

The majority of amphetamine users are polydrug users. Benzodiazepines may be used to self-medicate amphetamine-related problems, and they are commonly used by amphetamine users (Darke et al., 1994). Heroin is also used by stimulant users to self-medicate (Hando et al., 1997), and there are reports of a significant association between daily alcohol intoxication and methamphetamine smoking (Furr et al., 2000). This means that polydrug use (and interactions with medications such as those for HIV) always needs to be considered as a possibility when considering interventions for amphetamine users (Baker et al., 2004).

Where and when did the problem arise?

As we will see in many of the chapters in this book, ATS have been regarded in different ways across the decades. They have been seen as drugs which are useful in times of war for keeping troops alert, as drugs used by both the Allies and Axis countries during the Second World War and still used today, as a useful tool for doctors, nurses, students, truck drivers and others to stay awake during long shifts, and as a partying drug for many young people to keep them awake during the long hours of pleasure.

Bett in 1946 suggested that there were at least 39 clinical uses for amphetamine, including treatment for epilepsy, schizophrenia, morphine and cocaine addiction, behavioural problems in children, and migraine. In America, at least, it had become widely accepted at that time by the medical profession as a useful drug. These days the clinical uses of ATS are very few, partly because of the lack of evidence of many of the conditions that were supposedly helped by the drug and also by the recognition of the drug's dependence potential and long-term psychological effects.

The Benzedrine inhaler was introduced in 1932 (Grinspoon and Hedblom, 1975) and this became a popular way of treating both the effects of asthma and even head colds, as one of the effects of amphetamine is to dilate the nasal and bronchial passages. The use of Benzedrine from these inhalers became an early form of the illicit use of amphetamine. In 1946, Harry 'The Hipster' Gibson recorded a song called 'Who Put the Benzedrine in Mrs Murphy's Ovaltine' (http://mog.com/dermahrk/blog_post/134472; accessed 16 August 2008), which was a humorous take on the effects of taking Benzedrine and the supposed benefits it gave the user. The song was banned from broadcasting in 1947 and Gibson was blacklisted by the music industry. This indicates the fact that the drug use was in the public consciousness in the middle of the twentieth century.

Jack Kerouac's novel *On the Road* written in 1951 and published in 1957 was a defining novel of the 'beat generation'. This remarkable book, written almost as a stream-of-consciousness novel about a journey across America, was written under the influence of Benzedrine, and the phrenetic tone of the novel gives the reader the impression of that speed culture.

In the 1990s the emergence of methamphetamine as a potent, smokeable form of the drug was seen as the latest 'scourge' blighting our society following the warnings that we had about the dangers of crack cocaine in the late 1980s. Methamphetamine has clearly become a drug of choice in some areas and has been associated with violent motorcycle gangs, both on the west coast of North America and in New Zealand, and concern has been registered about the dangerous amateur laboratories producing the drug. These laboratories are dangerous both because of the potential for violent explosions during the production of the drug and because of the toxic by-products of the drug.

What are the dangers?

Is amphetamine really a 'scourge' or is current concern about it just another moral panic? It is, after all, part of the same drug family that until the 1960s was widely prescribed as a tonic and a slimming aid by general practitioners in many countries including the UK and America. Many drugs have this Jekyll-and-Hyde history of being thought to be useful and benign in the early days but become diabolic in their reputation as time passes and the true or other effects of the drug are known. One difficulty in labelling a drug as 'dangerous' is that for many occasional users there have been no ill effects. A study by Pates and Mitchell (1996) surveying the use of the drug in South Wales in the UK found that some people used very small

amounts, taken orally, on an occasional basis and experienced few problems with it. Other people surveyed were injecting up to 14 g/day and experiencing a host of psychological effects as a consequence.

What is clear is that these drugs, which have been used routinely by many people for purposes of alleviating fatigue in a work situation or for recreational purposes often without report of problems, are not benign. Chapter 2 of this book describes the physical effects and damage that may result from amphetamine use and Chapter 3 describes the psychological and psychiatric effects of the drug. One of the reasons that amphetamine use has not attracted as much publicity or been taken as seriously as other drugs such as heroin or cocaine (or even ecstasy) is that overdose from amphetamine use was rare (Pates, 1994), particularly in areas where the less potent amphetamine sulphate was in common use. With an increase in the use of methamphetamine, however, more concern has been expressed about the potential for fatalities from the use of this more potent form of amphetamine.

Kaye et al. (2008) reported on a survey of methamphetamine-related deaths in Australia. They comment that shift in the mid-1990s from the production and supply of amphetamine (sulphate) to that of the more potent methamphetamine has produced an increase in amphetamine-related problems. Examining the case notes of 371 individuals where coroners had decided that methamphetamine was a listed cause of death, they found that the great majority of deaths were accidental (only 14% being suicides). In the cases they reviewed, methamphetamine use or toxicity was identified as the direct cause of death, as an antecedent cause in 11% of the cases and as a significant contributory factor in 16% of cases. Cardiovascular problems were noted in more than half of the cases for which autopsy reports were available, the most common type of cardiac pathology being cardiac artery atherosclerosis. Cerebrovascular problems were found in 20% of the cases where autopsy findings were available, and non-traumatic cerebral haemorrhage was noted in half of these cases. Women were four times as likely as men to have had a cerebral haemorrhage. Kaye and colleagues comment that these deaths are not typically cases of death among young naive users. They also comment that there does not appear to be a clear dose–response relationship for methamphetamine toxicity.

In a study using electrocardiograms (ECG) obtained during screening in a previous trial, Haning and Goebert (2007) demonstrated that methamphetamine users showed abnormalities. They found that 36% of those studied had abnormal ECG results. The most frequent abnormality was a high frequency of prolonged QT intervals (the QT interval represents the interval of ventricular contraction or systole), 'which has implications for health of the myocardium, as the delay in the ventricular contractions may indicate cardiomyopathy or other cardio toxic injury' (p. 72). This is further evidence of the physical effects of methamphetamine.

Sexual risks of using amphetamine

The chapters in this book give descriptions of the problem of ATS use in various parts of the world. A number of papers have been published looking at its use

among various groups. For example, in a study of methamphetamine use and HIV risk in South Africa, Simbayi et al. (2006) surveyed 441 men and 521 women about their sexual behaviour and drug use; 18% of men and 12% of women had used methamphetamine. Methamphetamine use was associated with being male, having multiple sexual partners and having unprotected sexual intercourse. Condoms were used in less than half of the incidents of sexual intercourse. The authors comment that the association between methamphetamine use and sexual risk practices could fuel the spread of HIV infection in a part of the world where infectivity is already high. They also comment that although methamphetamine users were more likely to use condoms than other drug users, they were also more likely to exchange sex for money or goods. In a national study of young Americans, Iritani et al. (2007) looked at, among other things, criminality and sexual risk associated with methamphetamine use. They found that the unadjusted odds ratio showed that methamphetamine use among men was associated significantly with having more than one sexual partner, inconsistent or no condom use and regretting a sexual situation. The odds ratios were higher for women than for men, and there was a strong relationship between methamphetamine use, sexual risk behaviour, inconsistent or no condom use and regretting a sexual situation. When these odds ratios were adjusted to include sociodemographic characteristics, other illegal drug use and novelty-seeking behaviour, the odds ratio was no longer significant. The sociodemographic variables showed that men were twice as likely as women to be drug users, and Hispanics and Afro-Americans were much less likely to use drugs than white people but Native Americans were 4.2 times as likely to use as white people. Methamphetamine users were more likely to smoke cigarettes and use marijuana, cocaine and/or intravenous drugs in the previous year. Novelty-seeking behaviour was measured by Cloninger's Tridimensional Personality Questionnaire.

Halkitis et al. (2007) sought to understand the popularity of methamphetamine in the gay male community in New York. Using a longitudinal study for over a year where 450 club drug-using gay and bisexual men were assessed by quantitative measure, they found that the use of methamphetamine in this group is a multifaceted behaviour. This behaviour was driven by a desire to heighten sensations, especially in relation to sexual experience, as well as to overcome painful emotions. Methamphetamine is perceived to have aphrodisiac by-qualities and is often used to enhance and prolong sexual activity. In another study, Bolding et al. (2006) examined the use of crystal methamphetamine and its association with high-risk sexual behaviour among gay men in London. They surveyed 388 HIV-positive gay men attending HIV clinics, 266 HIV-negative gay men attending clinics for HIV testing, and 1592 gay men using gyms. They found that the percentage of men who had used methamphetamine in the last 12 months varied by sample (HIV treatment 12.6%, HIV testing 8.3% and gyms 19.9%). The majority of the men used methamphetamine only once or twice a year, but most methamphetamine users had taken other recreational drugs, and the users of methamphetamine plus other drug were more likely to report high-risk sexual behaviour than either other drug users or non-drug users. It is interesting to note that

methamphetamine appears to be popular amongst the gay male population especially in Britain.

Shoptaw and Reback (2007) reviewed the evidence regarding the prevalence of methamphetamine use amongst men who have sex with men and evaluated the factors that contribute to methamphetamine use and the potential for sexual transmission of HIV and other infectious diseases. They found that methamphetamine use is prevalent among men who have sex with men in the USA, Australia and in the UK and the use of methamphetamine may range from recreational through to chronic use and addiction. They found that the data indicated that the men who use this drug engage in concomitant HIV-related sexual behaviour. They also found that men who have sex with men using methamphetamine probably have higher rates of infection with HIV and syphilis than men who have sex with men who do not use the drug.

Will precursor regulation work?

Because most methamphetamine is made in 'kitchen' laboratories (i.e. non-pharmaceutical environments, often by amateurs) questions have been raised about whether controlling the precursors or substances required to make methamphetamine would reduce the supply of the drug. For example, in the USA, regulation of bulk ephedrine and pseudoephedrine was introduced in 1989, regulation of products containing ephedrine as the single active ingredient in 1995 and regulation of products containing pseudoephedrine in 1997. These were aimed at limiting access of these drugs to large-scale producers. Regulations aimed at small-scale producers were introduced on ephedrine products that included more than one medicinal ingredient in 1996 (Cunningham et al., 2008).

Cunningham et al. (2008) investigated whether the suppression of these substances affected the routes of administration of these drugs and thereby the relative potential risk of different routes. Using non-coerced admissions into treatment as a population sample, they found that admissions for snorting, smoking, swallowing and injecting initially rose sharply and then dropped when the 1995 regulations were introduced and snorting dropped after the 1997 regulations were introduced. Admissions for smoking showed a resurgence after the 1996 regulations and continued rising to higher levels than in 1995, and has continued to rise thereafter. This is interesting research because it used time series and a powerful quasi-experimental design to examine the effects of policy on drug use.

McKetin (2008) has suggested that as regulation of precursor chemicals in the developed world becomes more stringent the responsibility for controlling and policing chemical diversion may shift to the developing world which may have limited capacity to manage these problems. This could alter the relative availability of various drugs in different geographical areas of the world. As McKetin points out this may also increase levels of harm in these countries.

The chapters of this book closely examine the issues surrounding amphetamine use and the interventions provided to treat people with amphetamine-related

problems. Inevitably, there will be omissions in terms of countries and some of the issues around the use of amphetamine. We have tried to be as comprehensive and inclusive as possible.

References

Baker, A., Gowing, L., Lee, N. K. and Proudfoot, H. (2004) Psychosocial interventions for psychostimulant users. In: Baker, A., Lee, N. K. and Jenner, L. (eds), *Models of Intervention and Care for Psychostimulant Users*, 2nd edn. National Drug Strategy Monograph Series No. 51. Australia: Commonwealth of Australia, pp. 63–84.

Bett, W. R. (1946) Benzedrine sulphate in clinical medicine: a survey of the literature. *Postgraduate Medicine Journal* 22: 205–218.

Bolding, G., Hart, G., Sherr, L. and Elford, J. (2006) Use of crystal methamphetamine among gay men in London. *Addiction* 101(11): 1622–1630.

Cunningham, J. K., Liu, L. M. and Muramoto, M. (2008) Methamphetamine suppression and route of administration: precursor regulation impacts on snorting, smoking, swallowing and injecting. *Addiction* 103(7): 1174–1186.

Darke, S., Ross, J. and Cohen, J. (1994) The use of benzodiazepines among regular amphetamine users. *Addiction* 89: 1683–1690.

Furr, C. D. M., Delva, J. and Anthony, J. C. (2000) The suspected association between methamphetamine 'ice' smoking and frequent episodes of alcohol intoxication: data from the 1993 National Household Survey on Drug Abuse. *Drug and Alcohol Dependence* 59: 89–93.

Grinspoon, L. and Hedblom, P. (1975) *The Speed Culture: Amphetamine Use and Abuse in America*. Cambridge, MA: Harvard University Press.

Halkitis, P. N., Mukherjee, P. P. and Palamar, J. J. (2007) Multi-level modelling to explain methamphetamine use among gay and bisexual men. *Addiction* 102(Suppl 1): 76–83.

Hando, J., O'Brien, S., Darke, S., Maher, L. and Hall, W. (1997) *The Illicit Drug Reporting System (IDRS) Trial: Final Report*. NDARC Monograph No. 31. Sydney: National Drug and Alcohol Research Centre.

Haning, W. and Goebert, D. (2007) Electrocardiographic abnormalities in methamphetamine users. *Addiction* 102(Suppl 1): 70–75.

Iritani, B. J., Hallfors, D. D. and Bauer, D. J. (2007) Crystal methamphetamine use among young adults in the USA. *Addiction* 102(7): 1102–1113.

Kaye, S., Darke, S., Duflou, J. and McKetin, R. (2008) Methamphetamine related fatalities in Australia: demographics, circumstances, toxicology and major organ pathology. *Addiction* 103(8): 1353–1360.

Kerouac, J. (1957) *On the Road*. New York: Viking Press.

McKetin, R. (2008) Methamphetamine precursor regulation: are we controlling or diverting the drug problem? *Addiction* 103(4): 521–523.

Pates, R. (1994) Speed on prescription. *Druglink* 9(3): 16–17.

Pates, R. M. and Mitchell, A. (1996) Amphetamine use in South Glamorgan. *Journal of Substance Misuse* 1(3): 165–173.

Shoptaw, S. and Reback, C. J. (2007) Methamphetamine use and infectious disease-related behaviours in men who have sex with men: implications for interventions. *Addiction* 102 (Suppl 1): 130–135.

Simbayi, L. C., Kalichman, S. C., Cain, D., Cherry, C., Henda, N. and Cloete, A. (2006) Methamphetamine use and sexual risks for HIV infection in Cape Town, South Africa. *Journal of Substance Use* 11(4): 291–300.

United Nations Office on Drugs and Crime (UNODC) (2007) *2007 World Drug Report*. Vienna: United Nations Office on Drugs and Crime.