Drugs of abuse

Simon L Hill

Simon HL Thomas

Abstract

Toxicity related to drug misuse is a common reason for hospital presentation. The recent emergence of substantial numbers of novel psychoactive substances has made management more challenging because the exact constituents of branded products containing these may not be known and, when it is, the information available about clinical features and the management of toxicity is limited. Drugs of misuse are usefully classified by their primary clinical effects. Depressants including opioids, benzodiazepines and gamma-hydroxybutyrate cause sedation with depressed tendon reflexes. Commonly encountered stimulants are cocaine, amphetamines, methylenedioxymethamphetamine ('ecstasy'), cathinones (e.g. mephedrone), piperazines, piperidines and NBOMe compounds. Typical effects include tachycardia, hypertension, mydriasis, agitation and seizures. Examples of hallucinogens are synthetic cannabinoid receptor agonists, tryptamines (e.g. alpha methyltryptamine) and ergolines (e.g. lysergic acid diethylamide); some of these also have stimulant effects. The arylcyclohexamines ketamine and methoxetamine have dissociative actions. As well managing acute toxicity, blood-borne infections, sepsis and thrombosis arising from parenteral drug use should be treated. Longer term interventions are also needed to address drug use and the social and mental health issues that commonly co-exist.

Keywords Cannabis; cocaine; drugs of abuse; gamma-hydroxybutyrate; ketamine; methylamphetamine; methylenedioxymethamphetamine; opioids; piperazines; toxicity

Introduction

Drug misuse is important because of its prevalence and associated clinical and societal effects. It may cause acute toxicity or complications associated with administration methods such as blood-borne infections, sepsis and thrombosis after parenteral administration. There are also risks associated with intoxication, including accidents, sexually transmitted infections and unwanted pregnancies. Illicit drug use may compromise employment, education and personal relationships, culminating in financial hardship, homelessness and criminal behaviour such as theft, prostitution, drug dealing and violence. This article describes the acute toxicity that may occur after recreational drug use.

A recent important change in the pattern of illicit drug use is the emergence of novel psychoactive substances (NPS), sometimes erroneously referred to as 'legal highs' or 'research chemicals'.[1] These are psychoactive drugs that have recently become available as substances of misuse. They are not prohibited by United Nations Drug Conventions but may pose a public health threat comparable to that posed by substances that are prohibited.[2] NPS are often similar to traditional drugs of misuse, but with alterations made to the chemical structure so that the new compound is no longer captured by control of drugs legislation. Examples are shown in Table 1, alongside corresponding traditional drugs. The rapid emergence of substantial numbers of NPS continues to present a significant challenge to health services, not least because of the difficulty in identifying the chemicals involved in branded products and lack of information about clinical effects and appropriate management.

While traditional drugs of misuse have generally been obtained from street-level dealers, newer drugs that are often not initially subject to legal controls may be obtained from head shops and especially the internet. There has also been increasing recognition of the importance of prescription medicine abuse, including diversion and illicit supply.

Epidemiology

According to the 2012/13 crime survey for England and Wales, 8.2% of the adult (16–59 years) population reported illicit drug use in the last year, including 2.8% reporting use of a class A drug. The most common substances involved were cannabis (6.4%), nitrous oxide (2.0%), powder cocaine (1.9%), ecstasy (1.3%) and amyl nitrite (0.8%). A higher proportion (16.3%) of younger adults (aged 16–24 years) reported use of an illicit drug in the last year. Overall, however, illicit drug use has been declining in the UK over the last decade for many substances.[3] In the USA, 15.9% of the population over 12 years of age reported illicit drug use in the last year, including cannabis (12.6%) and cocaine (1.6%), while in the European Union the proportions o of those aged 15–34 years using a recreational drug in the last year were 11.7% for cannabis and 1.9% for cocaine, with substantial differences between countries.[4,5] While many people may experiment with illicit drugs, only a minority will develop addiction; the most problematic substances in this respect are opioids, cocaine and gamma-hydroxybutyrate (GHB).

Acute toxicity after recreational drug use is a common reason for hospital presentation, with 13,917 admissions to hospitals in England with a primary diagnosis of illicit drug poisoning in the 2013/14 reporting year, a 77% increase since 2003/04.[6] Many more illicit drug users are discharged from emergency departments without hospital admission. There were 2955 deaths registered as due to drug poisoning in England and Wales in 2013, with 1957 associated with drug misuse.[7] For the latter, heroin/morphine, methadone and other opioids were most commonly implicated and a recent change has been the increasing the numbers of deaths associated with tramadol (Figure 1).

Simon L Hill *MBBS MRCP BSc Dip Ther National Poisons Information Service (Newcastle Unit), Newcastle upon Tyne Hospitals NHS Foundation Trust and Medical Toxicology Centre, Institute of Cellular Medicine, Faculty of Medicine, Newcastle University, UK. Competing interests: none declared.*

Simon H L Thomas *MD FRCP FRCPE is Consultant Physician in the Newcastle Hospitals NHS Foundation Trust, Newcastle upon Tyne, UK; Professor of Clinical Pharmacology and Therapeutics at Newcastle University and Director of the National Poisons Information Service (Newcastle Unit). He trained in Clinical Pharmacology and Toxicology at St Thomas' Hospital, London and in Newcastle upon Tyne. His research interests are adverse drug reactions and poisoning. Competing interests: none declared.*

Classification for drugs of misuse

Primary effect	Chemical group	Examples	
		Traditional	**Novel**
Depressants	Opioids	Heroin Morphine Methadone	Desomorphine MT-45 AH-7921
	Benzodiazepines	Diazepam Temazepam	Etizolam Phenazepam
	Benzodiazepine-like	Zopiclone Zolpidem	
	Barbiturates		
	GHB/related	GHB GBL 1,4-Butanediol	
Stimulants	Cocaine	Cocaine	Dimethocaine Flourotrapococaine
	Amphetamines	Amphetamine MDMA Methylamphetamine PMA, PMMA Methiopropamine	
	Cathinones	Khat	Mephedrone Methylone MDPV α-pyrrolidinovalerophenone (α-PVP)
	Piperazines	1-Benzylpiperazine	Trifluoromethylphenylpiperazine (TFMPP)
	Benzofurans and difurans		5-(2-aminopropyl)benzofuran (5-APB) Bromo-DragonFLY
	Aminoindans		2-Aminoindane (2-AI) 5-Iodo-2-aminoindane (5-IAI) 5,6-Methylenedioxy-2-aminoindane (MDAI)
	D-Series	Dimethoxybromoamphetamine (*DOB*) Dimethoxymethylamphetamine (DOM)	
	2C-series	2C-B, 2C-E	
	NBOMe compounds		25I-NBOMe
	Piperidines	Methylphenidate	Desoxypipradrol Diphenylprolinol Ethylphenidate
	Thiophenes		Methiopropamine
Hallucinogens	Cannabinoids	Cannabis	JWH-018, AM-2201, AM-1220, RCS4, UR-144, XLR-11, APICA, STS-135, BB-22, LY2183240

(*continued on next page*)