

Frequency of non-fatal heroin overdose: survey of heroin users recruited in non-clinical settings

Michael Gossop, Paul Griffiths, Beverly Powis, Sara Williamson, John Strang

Heroin users are at risk of overdose, sometimes with fatal consequences. Studies have examined accident and emergency room data¹ and recorded deaths,² though such figures underestimate the full extent to which overdoses occur and are only a rough indicator of the prevalence of overdose among drug takers. A recent Australian study reported that about two thirds of a sample of heroin injectors had taken an overdose.³ The present study describes the frequency of drug overdose and the factors related to overdose among heroin users recruited in non-clinical settings.

Methods and results

During 1994, 438 heroin users were contacted and interviewed by privileged access interviewers⁴ as part of a study of early and episodic heroin users. Information on demographics, patterns of drug use, and overdose was collected by structured interviews. Onset of heroin use was comparatively recent for many of our sample (11% were in the first year of heroin use and 48% in the first three years of use), and many of our sample were not severely dependent on heroin (45% scoring 6 or less on the severity of dependence scale⁵). The average age in the sample was 28 years (range 13-54 years); two thirds (68%) were men.

Twenty three per cent (95% confidence interval 19% to 27%) of the heroin users (98/432) reported at least one overdose. The mean number of overdoses was 3.6 (2.6 to 4.6; mode = 1; range 1-34). Mean age of first heroin use was 20.6 years (20.1 to 21.1) and mean age of first overdose was 23.9 years (22.9 to 24.9). Of the users who had overdosed, 41% (39/96) reported at least one overdose in the previous year and 16% (15) reported more than one overdose.

Almost all overdoses (96/98) were reported by injectors; 31% of the injectors (96/313) had overdosed compared with only 2% (2/125) of the non-injectors (table 1). Users who had overdosed were also more severely dependent on heroin, older, and more likely to have been treated for a drug problem. Overdose was not related to gender; 28% of men and 33% of women reported at least one overdose ($\chi^2 = 0.33$, $P = 0.57$). Overdose was not related to reported frequency or quantity of heroin use. Overdose and non-overdose groups were both using heroin on three or four days a week ($t = 0.73$, $P = 0.47$), and average daily doses were

about half a gram of illegal street heroin for both groups (mean 0.58 g and 0.47 g respectively, $t = 1.04$, $P = 0.30$).

Reasons for overdose included taking a higher than usual dose (55%; 45% to 65%); heroin being stronger than usual (40%; 31% to 49%); using alcohol at the same time (30%; 21% to 39%); and using heroin again after abstinence (28%; 20% to 36%). Ten per cent (4% to 16%) reported having taken an overdose "deliberately." It is unclear whether this should be taken to imply suicidal intent or some deliberate intention of pushing the limits of intoxication. When asked how they recognised an overdose, almost all respondents reported the mouth or face changing colour and unconsciousness as the main indicators. Nearly half (48% (206/434); 43% to 53%) had been present when someone else overdosed.

Comment

Although the frequency of overdose was lower than in the Australian study,³ we were surprised at the frequency of reported and observed overdoses in this non-clinical sample of heroin users. Unlike the Australian sample, in which mean duration of heroin use was more than 10 years, many of our heroin users had used heroin for less than three years and many were not severely dependent (though severity of dependence was positively related to overdose). Surprisingly, we found no relation between frequency and quantity of heroin use and overdose. This may relate to the development of tolerance but requires further investigation.

Both the London and Australian studies suggest that overdoses occur more frequently among heroin users than has previously been recognised. Strategies and interventions should be developed to reduce the occurrence of overdoses and to minimise the adverse effects. Heroin users most at risk are injectors and those with higher levels of dependence and with higher levels of treatment contact. Overdoses were rare among users who took heroin by "chasing the dragon" (inhalation, through a tube, of vapours from heated heroin).

Drug treatment staff should be aware of the danger of overdosing among heroin users, and staff should be able to respond effectively to an overdose. Users should receive more information about how to avoid unintentional overdoses, especially those associated with loss of tolerance or taking heroin at the same time as other drugs, including alcohol. New responses should also be developed to deal with overdoses where they occur.

Funding: Department of Health.
Conflict of interest: None.

Drug Transitions Study, National Addiction Centre, London SE5 8AF
Michael Gossop, head of research
Paul Griffiths, senior researcher
Beverly Powis, research psychologist
Sara Williamson, research psychologist
John Strang, professor of the addictions

Correspondence to:
Dr Gossop.

BMJ 1996;313:402

Table 1—Characteristics of heroin users interviewed in non-clinical settings, London, 1994. Values are percentages (numbers) unless otherwise stated

	Users reporting overdose (n = 98)	Users not reporting overdose (n = 336)	Significance	
			t or χ^2 value	P value
Mean age	30.7	27.0	4.56	<0.001
Mean severity of dependence score	9.0	6.7	5.16	<0.001
Injectors	98 (96)	65 (213)	44.2	<0.001
Treated for drug problem	88 (86)	55 (184)	33.4	<0.001
In contact with outpatient drug clinic	26 (25)	7 (23)	25.4	<0.001
In contact with inpatient drug unit	28 (27)	16 (53)	6.4	<0.05
In contact with residential rehabilitation centre	37 (36)	14 (47)	27.2	<0.001
In contact with drop in centre	59 (58)	31 (104)	24.1	<0.001
In contact with needle exchange	74 (73)	44 (147)	26.3	<0.001
In contact with general practitioner	54 (53)	41 (137)	4.7	<0.05

- Ghosh H. Casualty departments and the monitoring of drug dependence. *BMJ* 1977;i:1381-2.
- National Institute of Drug Abuse. *NIDA Annual Emergency Room Data 1991. Data from the Drug Abuse Warning Network (DAWN). Series 1, No 11A*. Washington, DC: Department of Health and Human Resources, 1992. (DHHS Publication No 92-1955.)
- Darke S, Ross J, Hall W. Overdose among heroin users in Sydney, Australia. I. Prevalence and correlates of non-fatal overdose. *Addiction* 1995;91:405-11.
- Griffiths P, Gossop M, Powis B, Strang J. Reaching hidden populations of drug users by privileged access interviewers: methodological and practical issues. *Addiction* 1993;88:1617-26.
- Gossop M, Darke S, Griffiths P, Hando J, Powis B, Hall W, et al. The severity of dependence scale (SDS): psychometric properties of the SDS in English and Australian samples of heroin, cocaine and amphetamine users. *Addiction* 1995;90:607-14.

(Accepted 10 May 1996)