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Research paper

Infrequent opioid overdose risk reduction behaviours among young adult heroin users in cities with wide coverage of HIV prevention programmes

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ABSTRACT

Background: Opioid overdose risk reduction behaviours include some preventive behaviours to avoid overdoses (PB) and others to avoid death after overdose, such as never using heroin while alone (NUA). Few studies have examined the prevalence and predictors of these behaviours.
Aim: To establish the prevalence and predictors of PBs and NUA among heroin users, both injectors and non-injectors, in three Spanish cities.
Methods: 516 injecting and 475 non-injecting heroin users aged 18–30 were street-recruited in 2001–2003 and interviewed by face-to-face computer-assisted interview. PBs and NUA in the last 12 months were explored using open-ended and precoded questions, respectively. Specific predictors for three PB categories were investigated: control of route of drug administration, control of quantity or type of heroin used, and control of co-use of other drugs. Bivariate and logistic regression methods were used.
Results: Overall, the most prevalent PBs were: using a stable and not excessive amount of heroin (12.7%), injecting or using the whole heroin dose slowly or dividing it into smaller doses (12.4%), reducing or stopping heroin injection (8.3%), and not mixing heroin with tranquillisers (5.1%). Most PBs were significantly more prevalent among injectors than non-injectors. No one mentioned reducing the amount of heroin after an abstinence period. Some 36.2% had NUA. In multiple regression analysis, knowledge of risk factors for opioid overdose was a predictor of specific PBs, although this was not always the case. Use of syringe exchange programmes was a predictor of PB among injectors. However, attending methadone maintenance treatment (MMT) or other drug-dependence treatment was not a predictor of any opioid overdose reduction behaviour. Only ever having witnessed or experienced an overdose predicted PB in both injectors and non-injectors.
Conclusions: The proportion of heroin users with opioid overdose risk reduction behaviours is very low. Additional specific measures to prevent overdose are needed, as well as increased emphasis on reducing the risk of overdose in programmes to prevent HIV and other blood-borne infections in heroin injectors.

Introduction

Opioid overdose remains an important cause of death and emergency care among young people in many countries (Darke & Zador, 1996; EMCDDA, 2009; Green et al., 2009; Powis et al., 1999; Sporer, 2003). In Europe, an increase in overdose deaths was observed between 2003 and 2005 (Vicente, Giraudon, Matías, Hedrich, & Wiessing, 2009). In recent years Spain, England and Wales have reported the highest mortality rates from overdose in Europe (Morgan, Vicente, Griffiths, & Hickman, 2008). Studies have shown that non-fatal overdose is also very frequent among heroin users (annual prevalence 9–22%) (Brugal et al., 2002; Darke, Ross, & Hall, 1996; Gossop, Griffiths, Powis, Williamson, & Strang, 1996).

In the field of opioid overdose prevention, there is solid evidence of the effectiveness of drug-dependence treatments (Darke et al., 2007) and especially methadone maintenance treatment (MMT)

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(Brugal et al., 2005; Darke & Hall, 2003; Langendam, van Brussel, Coutinho, & van Ameijden, 2001; Sporer, 2003; van Ameijden, Langendam, & Coutinho, 1999). Furthermore, some studies also suggest a beneficial effect of supervised injection facilities (SIFs) (Darke & Hall, 2003; Hedrich, 2004; MSIC Evaluation Committee, 2003) or resuscitation using naloxone by persons witnessing an opioid overdose (Darke & Hall, 2003; Doe-Simkins, Walley, Epstein, & Moyer, 2009), and others describe how syringe exchange programmes (SEPs) have been used to implement specific programmes for overdose prevention (Doe-Simkins et al., 2009; Galea et al., 2005; Piper et al., 2008; Tobin, Sherman, Beilenson, Welsh, & Latkin, 2009).

Among the reasons that could explain the high rates of non-fatal opioid overdose are low prevalence of preventive behaviours to avoid opioid overdose (PB), which could be related with lack of knowledge of the main risk factors for opioid overdose (Dietze, Jolley, Fry, Bammer, & Moore, 2006; Green et al., 2009; Neira-León et al., 2006), such as use of the injected route (Brugal et al., 2002; Darke & Hall, 2003), low tolerance after a period of abstinence (Darke & Hall, 2003; Farrell & Marsden, 2008) and concurrent consumption of other central nervous system depressors (Darke & Hall, 2003). However, the complexity of the mechanisms involved in the adoption of PBs can hinder the success of these educational interventions (Moore, 2004; Rhodes, 2009). This complexity would also help to explain some paradoxical findings, like the association found by Dietze et al. (2006) between knowledge of the dangers of mixing benzodiazepines and/or alcohol with heroin and an increased likelihood of such mixing prior to overdose.

Data on the number of patients in MMT and sterile syringe distribution by SEPs in the cities of Barcelona, Madrid and Seville in 2001–2003 suggest wide coverage of these programmes (AACM, 2004; Bravo et al., 2007; de la Fuente, Bravo, et al., 2006; DGPNSD, 2006; Espelt et al., 2009; Secretaria del Plan Nacional sobre Sida, 2009). Other free drug-dependence treatment modalities were also easily accessible during that period (DGPNSD, 2006). However, even though harm reduction programmes generally included messages on overdose prevention, only Barcelona had a structured programme on naloxone distribution, albeit with limited coverage (AACM, 2002; AACM, 2003; AACM, 2004; Ilundain, 2009; Trujols, 2001). The Spanish national strategy on drugs does not explicitly mention overdose prevention as a priority (DGPNSD, 2005).

In 2009 the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) reported that 23 European Union member states addressed the prevention of infectious diseases among drug users as part of their national drug strategy, but only 12 countries included the reduction of drug-related deaths. The lack of awareness of the public health relevance of this issue could be a contributing factor to the sustained number of reported overdose deaths in Europe despite the downward trend in heroin injection and the expansion of treatment and harm reduction programmes in many countries.

Among the training needs identified by EMCDDA are the problems of reduced tolerance after abstinence periods and the consequences of taking multiple drugs (EMCDDA, 2008; EMCDDA, 2009). EMCDDA (2009) also emphasises that a large proportion of overdoses occur in the presence of witnesses, including drug users' peers, family members, passers-by, police, or prison staff, a situation which could be used to advantage in avoiding deaths from overdose. In fact, quite a few countries have reported the existence of specific materials or interventions aimed at helping families, police officers or prison staff to recognise and manage drug overdoses (EMCDDA, 2009). To be most effective, these interventions should be promoted in conjunction with the message "Never use heroin while alone" (NUA).

Since many studies have focused on the prevalence of overdose and its predictors and very little work has been done on the preventive behaviours that could avoid overdose or death, we focused our study, first, on measuring the prevalence of PB and NUA in a sample of regular heroin users and second, on determining the factors that predict these risk reduction behaviours.

Since heroin injectors and non-injectors usually differ in overdose risk (Brugal et al., 2002; Darke & Hall, 2003; Darke et al., 1996), HIV prevalence (de la Fuente et al., 1999) or contact with health care services (Vallejo et al., 2007) all the analyses were stratified by injecting status. We hypothesised that prevalence of PB would be greater among heroin injectors and that different preventive factors would be identified for injectors and non-injectors. We especially focused on whether knowledge of the principal risk factors for opioid overdose and MMT or other drug-dependence treatment attendance are predictors of opioid overdose risk reduction behaviours among non-injectors or injectors, and whether SEP attendance is a predictor of risk reduction behaviours among drug injectors.

Materials and methods

We used data from the 991 subjects recruited at baseline in the *Itinere* cohort of young adult heroin users. The methodology used has been described in detail elsewhere (de la Fuente et al., 2005; Neira-León et al., 2006). Inclusion criteria were age 18–30 years, residence in the cities of Barcelona, Madrid or Seville, and having used heroin in the last 90 days, and on at least 12 days in the 12 months before the interview. The entire sample was recruited in 2001–2003 in outdoor settings by chain-referral procedures (Heckathorn, 1997). A questionnaire was administered in a computer-assisted interview (Des Jarlais et al., 1999; Newman et al., 2002). Questions were included on sociodemographic variables, patterns of drug use, perceived dependence, sexual and injection behaviour, self-reported HIV serological status, non-fatal opioid overdose (last time and last 12 months occurrence), attendance to courses or meetings related to overdose as well as on use of SEP, MMT, other drug-dependence treatment and other health and social services in the last 12 months. To measure the degree of subjective dependence on heroin we used the Severity of Dependence Scale (SDS). This scale contains five items that measure the main psychological components of dependence, particularly compulsive use (Gossop et al., 1995). A cut-off point of between 3 and 4 on this scale has been suggested for heroin dependence (Gonzalez-Saiz et al., 2008; Gossop et al., 1995).

Opioid overdose was defined as an episode occurring after opioid use characterised by extreme difficulty in breathing, loss of consciousness and problems waking up or recovering consciousness, and possibly bluish skin or lips. Open-ended questions were included on knowledge of the main risk factors for overdose (Neira-León et al., 2006).

As part of opioid overdose risk reduction behaviours we considered preventive behaviours to avoid opioid overdose (PBs) and measures to avoid death if overdose occurred, such as never using heroin while alone (NUA). To explore PBs, participants were asked the following open-ended question: "In the last 12 months have you ever engaged in any behaviour to avoid overdose from heroin, methadone or other opioids?" If they had, they were asked to make an open list of these PBs. By using open-ended questions we tried to minimise the effects of suggestion or influencing the responses, and to respect the importance that users spontaneously give to different behaviours, as an approximation to the free-listing technique (Bravo et al., 2003). Two precoded questions were also asked about heroin use while alone or accompanied in the last 12 months. Since drug use in the street or in open spaces means that witnesses may have been present, these occurrences were always classified as using while accompanied by someone else. Hereinafter, all ref-