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Short report

The prevalence and correlates of buprenorphine inhalation amongst opioid substitution treatment (OST) clients in Australia

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ABSTRACT

Background: Diversion and injection of buprenorphine (Subutex®) and buprenorphine-naloxone (Suboxone®) have been well documented. Recent international research and local anecdotal evidence suggest that these medications are also used by other routes of administration, including smoking and snorting.
Methods: A cross-sectional sample of 440 opioid substitution treatment (OST) clients was recruited through pharmacies and clinics in three Australian jurisdictions, and interviewed face-to-face using a structured questionnaire. Eligible participants were those aged 18 or over, who had resided in their home state for at least six months, and had been in their current treatment episode for at least 4 weeks. We compared differences in characteristics between clients who had ever inhaled (smoked or snorted) buprenorphine (including buprenorphine-naloxone) and other OST clients. Logistic regression was used to identify correlates of buprenorphine inhalation. Sixty-eight clients who had never used buprenorphine were excluded from analysis.
Results: Sixty-five clients (18%) reported having ever inhaled buprenorphine, with Subutex® smoking being most common, reported by 50 clients (77%). In multivariable logistic regression, those who reported ever inhaling buprenorphine were significantly more likely to: be aged 35 or younger, have ever been in prison and have ever injected buprenorphine. Clients from New South Wales and Victoria were significantly less likely to have ever inhaled buprenorphine than those from South Australia.
Conclusions: Our data indicates that the inhalation of buprenorphine has occurred in a significant minority of Australian OST clients. The motivations, contexts and potential health consequences of buprenorphine use by these atypical routes of administration, particularly in a correctional setting, warrant further exploration.

Introduction

Buprenorphine (Subutex®) has been available as an opioid substitution treatment (OST) in Australia since 2001, with buprenorphine-naloxone (Suboxone®) introduced in 2006 amid growing concerns regarding reports of the diversion and injection of buprenorphine both in Australia and internationally (e.g. Aalto, Halme, Visapaa, & Salaspuro, 2007; Jenkinson, Clark, Fry, & Dobbin, 2005; Larance et al., 2009; Vidal-Trecan, Varescon, Nabet, & Boissonnas, 2003; Winslow, Ng, Mythily, Song, & Yiong, 2006). Recent data however shows that some injecting drug users (IDUs) also inject buprenorphine-naloxone (Degenhardt et al., 2009; Douglas Bruce, Govindasamy, Sylla, Kamarulzaman, & Altice, 2009).

Recent research has indicated that both buprenorphine and buprenorphine-naloxone are also used through routes of administration other than injecting. Intra-nasal use of buprenorphine was reported by 30% of patients receiving office-based buprenorphine treatment in France (Roux et al., 2008) and 26% of heroin injectors surveyed through a needle exchange in Sweden (Hakansson, Medvedeo, Andersson, & Berglund, 2007). Anecdotal evidence suggests that smoking of buprenorphine (typically 'chased' on foil) is becoming commonplace in Australian correctional facilities (Winstock, 2008). To date, however, there has been little published data exploring correlates of buprenorphine use via these routes of administration.

This paper investigated the prevalence of buprenorphine inhalation amongst a sample of patients currently receiving pharmacotherapy treatment for opioid dependence in three Australian

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jurisdictions, and explored key correlates of buprenorphine inhalation.

Methods

Data collection

This paper reports on data from a cross-sectional survey of 440 current OST clients (methadone, buprenorphine or buprenorphine-naloxone) in Victoria (VIC), New South Wales (NSW) and South Australia (SA), conducted as part of a wider post-marketing study of buprenorphine-naloxone (Degenhardt et al., 2009; Larance et al., 2009). Participants were recruited through advertisements posted in services and snowballing methods. Recruitment strategies were tailored within jurisdictions to ensure representation of clients from a variety of treatment settings, including community pharmacies, public clinics and private clinics. Eligible participants were those aged 18 years and over, who had resided in the interview state for at least six months prior to interview and had been in their current treatment episode for a minimum of 4 weeks. Participation in the study was voluntary, and participants were asked to provide written informed consent.

Recruitment and face-to-face structured interviews were conducted between March and June 2008. Data collected included demographics, patterns of alcohol and other drug use, characteristics of their treatment program including length of time on treatment, prescriber type, dosing schedule and access to take-away doses, injecting behaviour and experiences of use, diversion and injection of methadone, buprenorphine and buprenorphine-naloxone. Questions about diversion and injection of each OST were asked of all participants regardless of which treatment they were currently prescribed. Participants were reimbursed AUD$30 for their time and out-of-pocket expenses, in accordance with accepted practices.

The study received ethics approval from the University of New South Wales, South Eastern Sydney and Illawarra Area Health Service, Sydney South West Area Health Service, Victorian Department of Human Services and the University of Adelaide Human Research Ethics Committees.

Statistical analysis

Descriptive statistics were generated on the lifetime and recent (past six months) prevalence of buprenorphine inhalation across the sample. Univariate and multivariable logistic regression were used to examine associations between key correlates and lifetime buprenorphine inhalation. A significance level of 0.05 was used for all statistical tests, with all analyses conducted using Stata Version 10 (Statacorp LP, Texas, USA).

Results

OST client characteristics

Of the OST clients recruited into the study, 68 who had never used buprenorphine (either licitly or illicitly) were excluded from analysis. Of the 372 participants who reported ever having used buprenorphine, 85 were currently enrolled in methadone programs (23%), 149 were prescribed buprenorphine (40%) and 138 were prescribed buprenorphine-naloxone (37%). Nearly three quarters of current methadone clients reported having ever been prescribed buprenorphine or buprenorphine-naloxone ($n = 60$, 71%).

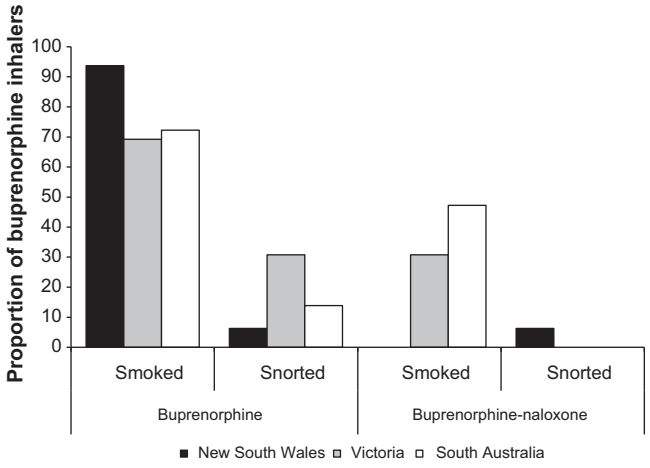

Fig. 1. Proportion of buprenorphine inhalers ($n = 65$) reporting lifetime smoking or snorting of buprenorphine or buprenorphine-naloxone, by state of residence.

Prevalence and characteristics of buprenorphine inhalers

Sixty-five participants (18%) reported having ever inhaled either buprenorphine or buprenorphine-naloxone, and are hereafter classified as 'buprenorphine inhalers'.

Amongst the 65 buprenorphine inhalers, smoking of buprenorphine was most common, reported by 50 clients (77%). Buprenorphine smoking was most common amongst OST clients from NSW, where 94% ($n = 15$) of 'buprenorphine inhalers' reported having ever smoked buprenorphine compared with 72% ($n = 26$) in SA and 69% ($n = 9$) in VIC (Fig. 1). Smoking of buprenorphine-naloxone was less common, reported by only 32% ($n = 21$) of all buprenorphine inhalers, and was most common amongst OST clients from SA (47%, compared with 31% from VIC and 0% in NSW).

One in five clients who reported ever smoking buprenorphine had done so within the previous six months, whilst almost half of all clients who had ever smoked buprenorphine-naloxone reported doing so in the previous six months (47%). Forty percent of OST clients who reported smoking buprenorphine in the past six months and 30% of OST clients who reported smoking buprenorphine-naloxone in the past six months reported obtaining those medications illicitly during that time.

Snorting of both buprenorphine and buprenorphine-naloxone was relatively uncommon, reported by just 6% and 2% of all buprenorphine inhalers, respectively. None of these clients reported also smoking buprenorphine.

Correlates of lifetime buprenorphine inhalation

Table 1 shows the main demographic and treatment characteristics of buprenorphine inhalers compared with other OST clients. Univariate analysis found that compared with other OST clients, those who reported lifetime buprenorphine inhalation were more likely to report: being aged 35 or younger, residing in South Australia, having ever been in prison, being prescribed their OST by a doctor in a public clinic and having ever injected buprenorphine or buprenorphine-naloxone (Table 1). Buprenorphine inhalation was not significantly associated with being prescribed buprenorphine.

Following multivariable analysis (Table 1), few variables remained significantly associated with buprenorphine inhalation. These were: being aged 35 years or younger (odds ratio (OR): 2.92, 95% confidence interval (CI): 1.77–5.44), having ever been incarcerated (OR (95% CI): 1.85 (1.02–3.35)), and having ever injected buprenorphine (OR (95% CI): 2.40 (1.27–4.53)). Clients from NSW and VIC were significantly less likely to report inhaling buprenor-