



Twelve-year trend in treatment seeking for buprenorphine abuse in Finland

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ARTICLE INFO

Article history:

Received 2 April 2012

Received in revised form 5 June 2012

Accepted 5 July 2012

Available online 25 July 2012

Keywords:

Buprenorphine

Heroin

Amphetamine

Substance abuse

Treatment seeking

Epidemiologic methods

ABSTRACT

Background: Buprenorphine abuse is becoming increasingly common worldwide. However, large-scale long-term studies of buprenorphine abuse are lacking. The objective of this study was to examine the trend in characteristics of clients seeking treatment for buprenorphine abuse and compare them to those seeking treatment for heroin and amphetamine abuse.

Methods: A 12-year descriptive study was conducted at the Helsinki Deaconess Institute (HDI), a public utility foundation responsible for providing treatment for substance abuse in the greater Helsinki area. All clients seeking treatment between 31 January 1997 and 31 August 2008 received a structured clinical interview concerning demographic characteristics and abuse patterns. Characteristics of clients who reported that their primary drug of abuse was buprenorphine ($n = 780$) were compared to those whose primary drug of abuse was either heroin ($n = 598$) or amphetamine ($n = 1249$).

Results: The annual proportion of buprenorphine clients increased from 3.0% in 1998 to 38.4% in 2008. Daily abuse (73.8%) and intravenous administration (80.6%) were common among buprenorphine clients. Concurrent abuse of prescription medications ($p < 0.001$), stimulants ($p = 0.001$) and alcohol ($p < 0.001$) increased from 1997 to 2008. Treatment seeking for heroin abuse declined to approximately 1% of clients annually after 2002. Buprenorphine clients were more likely to be daily users of their primary drug ($p < 0.001$), abuse prescription medications ($p < 0.001$) and administer drugs intravenously ($p = 0.001$ from 1997 to 2001) compared to heroin and amphetamine clients.

Conclusions: Our results highlight the increasing abuse of buprenorphine in Finland. Buprenorphine clients had risky abuse patterns in terms of daily use and intravenous administration. Concurrent substance abuse increased during the study period.

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1. Introduction

Prescription opioid abuse has become a major international public health problem (Degenhardt et al., 2008). In the United States (U.S.) prescription opioid abuse increased markedly during the last decade (Compton and Volkow, 2006; Office of Applied Studies, 2010), with 14% of the U.S. population self-reporting illicit use of prescription opioids during their lifetime (Substance Abuse

and Mental Health Services Administration, 2009). The epidemic of overdose deaths and hospitalizations in the U.S. has mirrored the rapid increase in the use of opioids since the 1990s (Coben et al., 2010; Bohnert et al., 2011). Urgent action is needed to better understand and address the prescription opioid abuse problem (Yokell et al., 2011; Office of National Drug Control Policy, 2011).

The U.S. research has highlighted frequent abuse of oxycodone and hydrocodone (Cicero et al., 2005, 2007). However, abuse of other prescription opioids including buprenorphine is also common, particularly in Europe and Asia (Yokell et al., 2011). Abuse of high-dose buprenorphine products (i.e., those for opioid substitution treatment) is also increasing in the U.S. (Johanson et al., 2012). Buprenorphine is a partial agonist of μ opiate receptor

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with a ceiling effect in humans (Martin et al., 1976; Walsh et al., 1994). While the abuse potential was initially presumed to be low (Jasinski et al., 1978), abuse of low-dose buprenorphine products (i.e., those marketed for pain) has been reported since the 1980s (O'Connor et al., 1988; Chowdhury and Chowdhury, 1990). Low-dose buprenorphine was the most frequently abused drug among intravenous (IV) drug users in Glasgow, Scotland, between 1989 and 1990 (Lavelle et al., 1991). In New Zealand, low-dose buprenorphine was withdrawn due to misuse in 1991 (Robinson et al., 1993). More recently, high-dose buprenorphine abuse has been reported in Australia (Larance et al., 2011b), Malaysia (Bruce et al., 2009), Sweden (Hakansson et al., 2007), Georgia (Otiashvili et al., 2010) and France (Vidal-Trecan et al., 2003). Low-dose buprenorphine abuse has been reported in some South Asian countries (Larance et al., 2011a). Studies have shown that buprenorphine abuse is especially common among clients receiving opioid substitution treatment (Vidal-Trecan et al., 2003; Moratti et al., 2010), but it is not restricted to these clients (Hakansson et al., 2007; Vicknasingam et al., 2010).

The availability and abuse of illicit drugs increased in Finland from the early 1990s (Hakkarainen and Tigerstedt, 2005). As a countermeasure, official opioid substitution treatment programs commenced with buprenorphine (Subutex) and methadone in 1997. Low-dose buprenorphine for pain was marketed prior to this time. The estimated number of problem drug users in Finland increased from 11,500–16,400 in 1998 (Partanen et al., 2000) to 14,500–19,000 in 2005 (Partanen et al., 2007). Seventy to 80% of problem drug users abused illicitly manufactured amphetamine and the remainder abused opioids (Partanen et al., 2007).

Reports of high-dose buprenorphine abuse in Finland date back to the late 1990s and coincide with the initiation of opioid substitution treatment (Partanen et al., 2004). Among 500 clients of needle exchange services in Finland's three largest cities between 2000 and 2002, 59% of clients had used buprenorphine intravenously in the previous month (Partanen et al., 2004). One third used buprenorphine on a daily basis. Buprenorphine was the most frequently used IV drug among IV drug users attending a needle exchange program in Helsinki (Alho et al., 2007). Buprenorphine abuse was the main reason for treatment seeking in 33% of all clients with substance use disorders in Finland in 2009 (Forsell et al., 2010). Buprenorphine findings in forensic post-mortem investigations have increased from less than 10 cases in 2000 to 104 cases in 2008 (Forsell et al., 2010). The buprenorphine/naloxone combination product (Suboxone) was first marketed in Finland in 2006. Since December 2007 it has been the only high-dose formulation of buprenorphine with marketing approval. Single ingredient buprenorphine (Subutex) was withdrawn in 2007 due to concerns about misuse.

Previous studies on the characteristics of buprenorphine users have had small sample sizes, been cross-sectional or had short follow-up periods (Basu et al., 2000; Winslow et al., 2006; Otiashvili et al., 2010; Vicknasingam et al., 2010; Aich et al., 2010; Schuman-Olivier et al., 2010; Bazazi et al., 2011), or concentrated on opioid substitution treatment clients (Vidal-Trecan et al., 2003; Roux et al., 2008; Moratti et al., 2010). The characteristics of prescription opioid users compared to heroin users have been studied (Sigmon, 2006; Fischer et al., 2008; Nielsen et al., 2011; Subramaniam and Stitzer, 2009; Wu et al., 2011). However, studies on the characteristics of buprenorphine users, changes in these characteristics over time, and in comparison to other drug users are lacking. These unanswered questions are important for both clinicians and policy makers.

The objective of this study was to examine the trend in characteristics of clients seeking treatment for buprenorphine abuse and compare them to those seeking treatment for heroin and amphetamine abuse.

2. Methods

2.1. Study context and sample

Data were collected at the Helsinki Deaconess Institute (HDI), a large public utility foundation that provides inpatient and outpatient treatment services for persons with alcohol and other substance abuse disorders. The HDI provides services to clients from the greater Helsinki metropolitan area, including Espoo, Vantaa and eight other nearby municipalities (overall population 1.3 million people). The majority of Finnish illicit drug users live in this area (Partanen et al., 2007). Clients of the HDI were self-referred, referred by other clinicians, or transferred from other treatment units. This study was part of the Huuti consortium project which investigated drug abuse and addiction in Finland.

2.2. Study design

This was a descriptive study of clients seeking treatment between January 31, 1997 and August 31, 2008 ($n=4817$). Those clients who reported buprenorphine ($n=780$), heroin ($n=598$) or amphetamine ($n=1249$) as their primary drug of abuse were included. These substances were selected because they caused most substance abuse problems in Finland. For the purpose of the present study, abuse of buprenorphine refers to abuse of high-dose buprenorphine products.

Data were collected using a structured questionnaire at each client's initial visit. If the questionnaire was not fully completed during a client's initial consultation, then missing data were collected during a client's subsequent consultations if they occurred within three months of the initial consultation. Data pertaining to each client's age at their initial consultation and prior substance abuse were only collected during each client's initial visit. Each client was only included in the study once, even if they presented for additional treatment at a later date.

2.3. Data collection

All clients were interviewed as part of routine clinical practice by treatment staff (specialist physicians and nurses) during their initial consultation. The structured questionnaire included items pertaining to each client's demographics (sex, age, nationality, housing), and alcohol and other substance abuse (trajectories, mode and level of abuse, variety of drugs abused). On the basis of the interviews, clients were referred to either the HDI's treatment facilities or alternative treatment units. Clients seeking treatment for buprenorphine abuse were primarily referred for symptomatic detoxification with lofexidine.

Ethics approval was obtained from the Research Ethics Committee of the North-Savo Hospital District and the Ethics Committee of the Helsinki Deaconess Institute. The Data Protection Ombudsman also approved the study protocol.

2.4. Measures and definitions

The interview questionnaire included adapted versions of the European Addiction Severity Index (EuropASI) and Treatment Demand Indicator (TDI). The EuropASI is a European version of Addiction Severity Index (ASI) (McLellan et al., 1980; Blacken et al., 1994). The TDI is used by the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) (Simon et al., 1999; European Monitoring Centre for Drugs and Drug Addiction, 2000). Abuse was defined as a pattern of harmful psychoactive substance use causing damage to health (World Health Organization, 2012). For the purpose of the study, the terms harmful use and drug abuse were considered synonymous with each other.

Each client's primary drug of abuse was defined using the Treatment Demand Indicator (TDI) definition as the drug causing the client the most problems, as defined by the clients themselves or by diagnoses based on International Classification of Diseases (ICD-10). Clients were categorized as buprenorphine, heroin or amphetamine clients based on their primary drug of abuse. Clients were interviewed regarding the route and frequency of administration of their primary and secondary drugs of abuse, the age at which they started abusing their primary drug of abuse and concurrent substance abuse. The frequency of drug use was categorized as daily or non-daily use (2–6 times per week, once per week or less, no use during the previous month). Routes of administration were categorized as IV or other (oral, intranasal and smoking). Concurrent substance abuse over the past month included alcohol, opioids (heroin, opium, morphine, ethylmorphine, codeine, oxycodone, methadone, buprenorphine, pethidine, tramadol, fentanyl, dextropropoxyphene, pentazocine, other opioids), stimulants (cocaine, amphetamine, metamphetamine, MDMA, other stimulants), cannabis and prescription medications (barbiturates, benzodiazepines, neuroleptics, other hypnotics and sedatives). The source (e.g., legal prescription, street market) was not defined. Clients were regarded as homeless if they could not report their address.

2.5. Data analysis

Pearson chi-square (χ^2) test and Fischer's exact test were used to compare categorical variables between client groups and time periods. Statistical differences between groups in continuous variables were analyzed using Mann-Whitney U-test and Kruskal-Wallis test. Comparisons between buprenorphine, heroin and

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