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Smoking cessation treatment among office-based buprenorphine treatment patients

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Abstract

Opioid-dependent patients smoke at high rates, and office-based buprenorphine treatment provides an opportunity to offer cessation treatment. We examined tobacco use and smoking cessation treatment patterns among office-based buprenorphine treatment patients. We reviewed records of 319 patients treated with buprenorphine from 2005–2010. We examined smoking status, cessation medication prescriptions, and factors associated with receipt of cessation prescriptions. Mean age was 43.9 years; most were men (74.2%) and Hispanic (70.9%). At buprenorphine initiation, 21.9% had no documentation of smoking status, while 67.4% were current, 10% former, and 0.9% never smokers. Of current smokers, 16.8% received smoking cessation prescriptions. Patients retained (vs. not retained) in buprenorphine treatment were more likely to receive smoking cessation medications (26.3% vs. 11.2%, $p < 0.005$). We observed a high tobacco use prevalence among buprenorphine patients, and limited provision of cessation treatment. This is a missed opportunity to impact the high tobacco use burden in opioid-dependent persons.

Keywords

Buprenorphine; opioid; office-based treatment; tobacco smoking; smoking cessation

1. INTRODUCTION

Opioid-dependent patients have a higher tobacco use prevalence than the general population. In methadone-maintained patients, tobacco use ranges from 77% to 92% (Clemmey, Brooner, Chutuape, Kidorf, & Stitzer, 1997; Nahvi, Richter, Li, Modali, & Arnsten, 2006; Richter, Gibson, Ahluwalia, & Schmelzle, 2001). Research evaluating tobacco use

prevalence in buprenorphine-treated patients is sparse, but available estimates range from 66% to 93% (Chisolm et al., 2013; Harrell, Montoya, Preston, Juliano, & Gorelick, 2011; Pajusco et al., 2012), on par with estimates among patients in outpatient substance abuse treatment settings (Guydish et al., 2011). This is in marked contrast to the 19% prevalence in US population-based surveys (Centers for Disease Control and Prevention, 2012), and has corresponding health consequences, with death rates of opioid-dependent smokers 4 times that of non-smokers (Hser, McCarthy, & Anglin, 1994; Hurt et al., 1996).

Despite the high tobacco burden in opioid-dependent patients, there is limited smoking cessation treatment provision in substance abuse treatment programs (Friedmann, Jiang, & Richter, 2008; Hunt, Cupertino, Garrett, Friedmann, & Richter, 2012; Knudsen, Studts, Boyd, & Roman, 2010). Evidence-based guidelines recommend that primary care providers systematically assess and treat tobacco use (Fiore et al., 2008). Buprenorphine treatment is offered in the setting of primary care treatment, and buprenorphine treatment patients are more likely than methadone patients to be employed (Sullivan, Chawarski, O'Connor, Schottenfeld, & Fiellin, 2005), potentially eliminating important barriers in access to smoking cessation treatment. Office-based buprenorphine treatment in primary care settings can thus increase provision of smoking cessation treatment among opioid-dependent patients, however, this has not been described.

The goal of this study is to describe tobacco use and cessation treatment patterns in patients receiving office-based buprenorphine treatment, and to explore factors associated with smoking cessation treatment. This will help to guide development of interventions to address tobacco use for opioid-dependent persons receiving office-based buprenorphine treatment.

2. MATERIALS AND METHODS

2.1 Overview

We conducted a retrospective chart review of all patients who initiated buprenorphine treatment in an urban community health center to examine their smoking patterns and smoking cessation treatment.

2.2 Setting

We reviewed records of all patients receiving buprenorphine treatment in a community health center, 2005–2010, immediately after a buprenorphine treatment program was established. The buprenorphine treatment program has been previously described (Cunningham et al., 2008), and is located in a neighborhood in the Bronx, NY with 57% Hispanic and 39% Black residents, a 20% prevalence of tobacco use, and high rates of premature death (Olson, Van Wye, Kerker, Thorpe, & Frieden, 2006). Briefly, 6 general internists work closely with a clinical pharmacist to provide buprenorphine maintenance treatment in the context of general primary care. Buprenorphine treatment typically consists of monthly visits with a primary care physician, in which patients address general health issues, and receive buprenorphine prescriptions, urine toxicology tests, and counseling. Social workers are also available to all health center patients, and can provide referral to intensive substance abuse treatment if necessary.

To receive buprenorphine treatment at the health center, patients had to be 18 years or older, opioid dependent per Diagnostic and Statistical Manual IV criteria, and insured by a health plan accepted at the health center or willing to pay for treatment on a sliding scale.

Individuals were excluded from buprenorphine treatment if they were: 1) hypersensitive to buprenorphine or naloxone, 2) pregnant, 3) alcohol or benzodiazepine dependent, 4) with transaminase levels greater than 5 times normal, 5) diagnosed with severe, untreated psychiatric illness, and 6) taking more than 60 mg of methadone daily in the past month.

Smoking status was assessed on a standard form as part of the health center initial or annual history and physical exam or during a detailed substance use history review conducted prior to buprenorphine initiation. Smoking cessation treatment was offered to buprenorphine patients on an ad-hoc basis during routine clinical care. There were no specific clinical protocols in the buprenorphine treatment program regarding smoking assessment or cessation treatment.

2.3 Study Sample

Patients who initiated buprenorphine treatment at the community health center between December 2005 and June 2010 were identified from medical records and included in this analysis. The affiliated IRB deemed this study exempt.

2.4 Data Collection

We extracted data on smoking status, buprenorphine and smoking cessation medication prescriptions, visits, urine toxicology tests, and socio-demographic characteristics from medical records.

Smoking status was determined by a clinician who reviewed the standardized buprenorphine treatment intake form, the health center's standardized initial/annual exam forms, free text written notes, and problem and medication lists. We obtained data about smoking status at the time of buprenorphine initiation (+/- 1 month). Smoking status was categorized as current smoker, former smoker, never smoker, or unknown smoking status. Current smokers were those whose medical records included: 1) diagnosis of smoker or nicotine dependence on the problem list; 2) "current smoker" box checked on standardized clinical forms; 3) free text in medical notes indicating current smoking (e.g., description of the number of cigarettes smoked per day); or 4) prescriptions for smoking cessation medications. Former smokers were those with 1) a diagnosis of nicotine dependence in remission on the problem list; 2) "former smoker" box checked on standardized clinical forms; or 3) free text in medical notes indicating the patient quit smoking (e.g., a description of a specific time period since the patient quit smoking). Never smokers were those with none of the criteria for current or former smokers, *and* with never smoking indicated in the standardized clinical forms or free text in medical notes. Unknown smoking status was assigned if these data did not specifically indicate whether a patient was a current, former or non-smoker.

To estimate treatment effects, we reassessed smoking status in patients prescribed smoking cessation treatment in all clinical notes over the 6 months following the date of prescription of smoking cessation medication. Smoking status was categorized as abstinent (i.e.,

documentation of self-reported abstinence without subsequent mention of smoking), relapsed (i.e., documentation of smoking resumption following initial abstinence), continued smoking (i.e., documentation of continued smoking without cessation), or not recorded. If smoking status was documented following cessation medication prescription, but not documented in subsequent visits, the last observation was carried forward. Although this approach may not capture relapse following initial cessation or delayed tobacco cessation, similar methods have been used in prior studies (Nahvi, Wu, Richter, Bernstein, & Arnsten, 2013).

Prescriptions for buprenorphine, buprenorphine/naloxone and all FDA-approved smoking cessation medications were extracted from the medical center's electronic prescription database. The date of the first buprenorphine prescription was used as the date of buprenorphine treatment initiation. Smoking cessation medications included prescriptions for: varenicline, bupropion (for smoking cessation), and nicotine replacement therapy (patch, gum, inhalers, lozenges, and nasal spray). We included smoking cessation medications prescribed from 6 months prior to 6 months after the date of buprenorphine treatment initiation.

Urine toxicology test results were extracted from medical records, including those to assess opiates, methadone, oxycodone, benzodiazepines, cocaine, cannabinoids, and amphetamines. We determined baseline drug use from the urine toxicology test closest to the date in which buprenorphine treatment was initiated, including up to 90 days prior to and 7 days after treatment initiation.

Treatment retention was determined by extracting buprenorphine prescription and visit data during the 210 days after initiating buprenorphine treatment. We categorized treatment retention as follows: 1 month retention includes patients with either a medical visit or active buprenorphine prescription between day 30–60, 3-month retention includes patients retained at 1 month plus a visit or prescription between day 90–120, and 6-month retention includes patients retained at 1 and 3 months plus a visit or medication between day 180–210.

Socio-demographic characteristics were extracted from the medical center's administrative database, and included: age, gender, race/ethnicity, primary language, and insurance status.

2.5 Analyses

We describe patients' socio-demographic, smoking, and buprenorphine treatment characteristics using simple frequencies. In exploratory analyses, we examined socio-demographic and clinical factors associated with receipt of smoking cessation medications using chi-square tests. These included age, gender, race/ethnicity, primary language (English vs. Spanish), insurance status (public vs. private vs. none), and baseline toxicology tests indicating cocaine or benzodiazepine use. Analyses were conducted in STATA v.11 (College Station, TX).

3. RESULTS

Of the 319 patients who initiated buprenorphine treatment, the mean age was 43.9 years, and the majority were male (74.2%), Hispanic (70.9%), and had public insurance (56.5%) [Table 1]. At buprenorphine initiation, 61.8% had toxicology tests positive for opiates, methadone or oxycodone; 24.3% for cocaine; 24.3% for marijuana, and 9.8% for benzodiazepines. At 1, 3 and 6 months, 81.2%, 54.6% and 37.6% were retained in buprenorphine treatment, respectively.

At the time of buprenorphine initiation, 213 (66.8%) patients were current smokers, 33 (10.3%) former smokers, 3 (0.9%) never smokers, and 70 (21.9%) had an unknown smoking status. Of the 213 current smokers, 33 (15.5%) were prescribed smoking cessation medications by 15 medical providers in the 6 months prior to through the 6 months after initiating buprenorphine treatment. The most commonly prescribed smoking cessation medications were nicotine patches (n=20, 9.4%) and varenicline (n=15, 7.0%). The median time between initiating buprenorphine treatment and being prescribed a smoking cessation medication was 55 days (interquartile range=0–96 days, range from 162 days prior to 182 days following buprenorphine initiation). Among the 33 patients prescribed smoking cessation medications, 3 achieved abstinence, 3 achieved initial abstinence but relapsed, 17 continued tobacco use, and no assessment was available for 10.

The only factor associated with prescriptions for smoking cessation medications was buprenorphine treatment retention at 6 months (25.3% of retained patients were prescribed cessation medications vs. 9.7% of non-retained patients, $p<0.005$). Age, gender, race/ethnicity, primary language, insurance status, and baseline cocaine or benzodiazepine use were not associated with prescriptions for smoking cessation medications.

4. DISCUSSION

In this study of 319 opioid-dependent patients receiving office-based buprenorphine treatment, 67% of patients were current smokers. Despite high tobacco use prevalence, provision of cessation treatment, and repeated assessment of tobacco use were limited. This is a missed opportunity to impact the high prevalence and disease burden of tobacco use in opioid-dependent persons, particularly in a setting in which comprehensive primary care is provided.

At least 67% of patients were current smokers at the time of buprenorphine treatment initiation. Because smoking status was not documented in nearly 22% of patients, it is possible that up to 89% were current smokers. This tobacco prevalence is consistent with that previously described among buprenorphine-treated patients (Chisolm et al., 2013; Harrell et al., 2011; Pajusco et al., 2012), and markedly higher than the prevalence of tobacco use in US population-based surveys (Centers for Disease Control and Prevention, 2012). This disproportionately high tobacco burden creates an imperative for buprenorphine providers to address tobacco use.

In our study of patients receiving office-based buprenorphine treatment, where “usual care” did not include specific tobacco treatment policies nor an electronic medical record with

smoking cessation treatment prompts, the opportunity to assess smoking status was missed. Smoking status was not assessed or recorded at buprenorphine initiation for almost one-quarter of patients. Additionally, after providing smoking cessation medication, providers also did not follow up on assessing smoking status. Over 30% of smokers prescribed cessation medications had no subsequent tobacco use assessment. Despite national guidelines and research evidence supporting systematic assessment of tobacco use to increase cessation treatment provision and cessation success (Fiore et al., 2008), and extensive evidence that smoking cessation improves substance abuse treatment outcomes (Friend & Pagano, 2005; Kohn, Tsoh, & Weisner, 2003; Lemon, Friedmann, & Stein, 2003; Prochaska, Delucchi, & Hall, 2004; Tsoh, Chi, Mertens, & Weisner, 2011), providers may not be prioritizing tobacco use as highly as other health concerns.

The low rate of tobacco use assessment was further compounded by the low rate of smokers being prescribed cessation treatment. Only 33 of 213 smokers were prescribed smoking cessation treatment during the 6-month window around buprenorphine treatment initiation. Though the 15.5% rate of smoking cessation medication provision is low, it is consistent with rates reported in primary care and substance abuse treatment settings (Browning, Ferketich, Salsberry, & Wewers, 2008; Ferketich, Khan, & Wewers, 2006; Friedmann et al., 2008; Fuller et al., 2007; Hunt et al., 2012; Payne et al., 2012; Richter, Choi, McCool, Harris, & Ahluwalia, 2004). It is particularly concerning, however, because without treatment, smoking cessation rates among opioid-dependent patients are negligible. In a randomized trial comparing substance abuse and smoking cessation treatment with substance abuse treatment alone the cessation rate in participants receiving substance abuse treatment alone was 0 (Reid et al., 2008). In another study, among opioid-dependent smokers participating in research, there was a high rate of baseline smoking observed (92%) which remained unchanged after 1 year (Haas et al., 2008).

In our study, patients retained in buprenorphine treatment at 6 months were more likely to be prescribed smoking cessation treatment than those with shorter buprenorphine treatment duration. This might indicate that physicians are delaying a discussion of initiating treatment for smoking cessation with their patients. Few studies have addressed the question of optimal timing of smoking cessation treatment in substance abuse treatment, with inconsistent results. These studies have evaluated concurrent smoking cessation treatment (i.e., smoking cessation treatment at initiation of substance abuse treatment) compared to either substance abuse treatment alone, or to delayed smoking cessation treatment (started 6 weeks to 6 months following initiation of substance abuse treatment). In a trial of 499 smokers in intensive alcohol treatment, significantly more subjects receiving concurrent counseling and nicotine replacement participated in smoking treatment. Long-term smoking cessation did not differ between groups however, and prolonged alcohol abstinence rates were lower in the concurrent than the delayed group (Joseph, Willenbring, Nugent, & Nelson, 2004). In a trial of 40 patients initiating buprenorphine treatment, concurrent bupropion initiation was associated with poor treatment retention and was not more efficacious than placebo for smoking cessation (Mooney et al., 2008). By contrast, another trial reported significantly fewer participants received smoking cessation treatment if it was delayed rather than concurrent (Kalman et al., 2001).

This study has limitations. It was conducted in a single clinical setting prior to implementation of a comprehensive EMR with standardized tobacco use assessment. Biochemical assessment of tobacco use status was not performed. Smoking status was assessed over time only in patients prescribed smoking cessation treatment, and is limited by buprenorphine treatment drop-out and lack of documentation. Chart data did not include use of non-pharmacologic treatments, cessation medications obtained from outside providers, medications that were offered but declined, or duration of or adherence to cessation medications. We also could not assess use of over-the-counter medications. However, since many of the health center patients have public or no insurance, and can receive over the counter nicotine patch and gum at reduced cost with a prescription, we believe the impact of this limitation on our findings is minimal. Nonetheless, to our knowledge this is the first study to report the provision of smoking cessation treatment among buprenorphine-treated patients.

In summary, patients in office-based buprenorphine treatment have a high tobacco use prevalence, but few received smoking cessation treatment. Interventions are necessary to increase assessment and treatment of tobacco use among patients receiving buprenorphine treatment.

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Table 1

Demographic and buprenorphine treatment characteristics of 319 patients who initiated buprenorphine treatment

Sociodemographic characteristics	n (%)
Age (mean years $\pm$ SD)	43.9 $\pm$ 10.1
Male	244 (74.2)
Race/ethnicity	
Hispanic	226 (70.9)
Non-Hispanic black	54 (16.9)
Non-Hispanic white	19 (6.0)
Non-Hispanic other	16 (5.0)
Unknown	4 (1.3)
English primary language	232 (72.7)
Insurance status *	
Medicaid	160 (52.0)
Medicare	14 (4.5)
Private insurance	29 (9.4)
Uninsured	105 (34.1)
Buprenorphine treatment characteristics	
Baseline drug use [†]	
Opioids (opiates, methadone, or oxycodone)	183 (61.8)
Opiates	132 (44.6)
Oxycodone	18 (6.1)
Methadone	84 (28.4)
Benzodiazepines	29 (9.8)
Cocaine	72 (24.3)
Cannabinoids	72 (24.3)
Amphetamines	1 (0.3)
Treatment retention	
1 month	259 (81.2)
3 months	174 (54.6)
6 months	120 (37.6)

* Missing data: 11 insurance

[†] n=296 participants with baseline urine toxicology tests (between 90 days prior to and 7 days after initiating buprenorphine treatment)

Table 2

Smoking and smoking cessation treatment patterns among 319 patients who initiated buprenorphine treatment

Smoking characteristics	N=319 n (%)
Smoking status at buprenorphine treatment initiation	
Never smoked	3 (0.9)
Former smoker	33 (10.3)
Current smoker	213 (66.8)
No documentation of smoking status	70 (21.9)
Smoking cessation treatment among current smokers *	N=213
Prescribed any smoking cessation medication	33 (15.5)
Varenicline	15 (7.0)
Bupropion	1 (0.5)
Nicotine patch	20 (9.4)
Nicotine gum	9 (4.2)
Nicotine inhaler	2 (0.9)
Timing of smoking cessation medication	
Prescribed smoking cessation medications prior to initiating buprenorphine treatment	8 (24.2)
Prescribed smoking cessation medications at the same time as initiating buprenorphine treatment	2 (6.1)
Prescribed smoking cessation medications after initiating buprenorphine treatment	23 (69.7)
Median time in days between initiating buprenorphine treatment and prescribed smoking cessation medications (IQR)	55 (IQR=0-96) [‡]
Smoking status among patients prescribed smoking cessation medications over the 6 months following cessation medication prescription (N=33) [‡]	
Abstinent (documented cessation without subsequent mention of smoking)	3 (9.1)
Relapsed (documented smoking following initial abstinence)	3 (9.1)
Continued smoking (documented continued smoking without cessation)	17 (51.5)
No documentation of smoking status	10 (30.3)

* Smoking cessation treatment in the 6 months prior to the 6 months after initiation of buprenorphine treatment.

[‡] Range from 162 days prior to 182 days following buprenorphine initiation

[‡] Following a visit in which abstinence, relapse or smoking was documented, if smoking status was not documented in subsequent visits, the last observation was carried forward.