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Characterizing pain and associated coping strategies in methadone and buprenorphine-maintained patients

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ABSTRACT

Background: Chronic pain is common among patients receiving opioid maintenance treatment (OMT) for opioid use disorder. To aid development of treatment recommendations for coexisting pain and opioid use disorder, it is necessary to characterize pain treatment needs and assess whether needs differ as a function of OMT medication.
Methods: A point-prevalence survey assessing pain and engagement in coping strategies was administered to 179 methadone and buprenorphine-maintained patients.
Results: Forty-two percent of participants were categorized as having chronic pain. Methadone patients had greater severity of pain relative to buprenorphine patients, though both groups reported high levels of interference with daily activities, and participants with pain attended the emergency room more frequently relative to participants without pain. Only 2 coping strategies were being utilized by more than 50% of participants (over-the-counter medication, prayer).
Conclusions: Results indicate that pain among OMT patients is common, severe, and of significant impairment. Methadone patients reported greater severity pain, particularly worse pain in the past 24 h, though interference from pain in daily activities did not vary as a function of OMT. Most participants with pain were utilizing few evidenced-based pain coping strategies. Increasing OMT patient access to additional pain treatment strategies is an opportunity for immediate intervention, and similarities across OMT type suggest interventions do not need to be customized to methadone vs. buprenorphine patients.

1. Introduction

In 2014, more than 11 million people abused and more than 2 million people sought treatment for heroin or a prescription pain reliever (Center for Behavioral Health Statistics and Quality, 2015). Maintenance on an opioid agonist medication like methadone or buprenorphine is a widely-used approach for the treatment of OUD, and rates of opioid maintenance treatment (OMT) entries have continued to increase, with more than 113,000 people initiating OMT treatment in 2012 (Substance Abuse and Mental Health Services Administration (SAMHSA) and Center for Behavioral Health Statistics and Quality, 2014). OMT with methadone and buprenorphine differ in meaningful ways. Methadone is a full mu-receptor agonist and a schedule II drug in the United States that is dispensed daily for the treatment of OUD from a regulated clinic setting. Buprenorphine is a partial agonist on the mu-opioid and ORL-1 receptors and partial antagonist on the kappa-opioid receptor, and a schedule III drug in the United States that can be prescribed from a physician's office setting on an intermittent basis (e.g., every 30 days). Evidence suggests that OMTs draw different types of patients. For instance, relative to methadone, buprenorphine-maintained patients are more likely to be male, employed, have health insurance, and may have less severe OUD (e.g., shorter use and treatment histories, less injection drug use; Sullivan et al., 2005; Fingerhood et al., 2014).

Chronic pain is a critical problem among many OMT patients. Up to 62% of OMT patients endorse chronic pain (Jamison et al., 2000; Rosenblum et al., 2003; Ilgen et al., 2006; Barry et al., 2008, 2009b; Dunn et al., 2014; Stein et al., 2015; Voon et al., 2015), compared to 30.7% in the general population (Johannes et al., 2010), and there is also growing evidence that OMT patients may have a different experience of pain relative to the general population. Many OMT patients show signs of opioid-induced hyperalgesia, a super-sensitivity to pain that is hypothesized to occur following extended exposure to opioid agonists (Brush, 2012). This has

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been best characterized among methadone-maintained patients (Compton et al., 2000, 2001, 2008; Peles et al., 2011; Prosser et al., 2008) but has been observed among buprenorphine-maintained patients as well (Compton et al., 2001). In addition, a longitudinal study reported that pain emerged over time among 44.9% of OMT patients who endorsed no pain at entry to methadone treatment (Dhingra et al., 2015), suggesting that OMT may itself contribute to increased pain sensitivity, and evidence suggests that hyperalgesia may be evident for several months after OMT treatment cessation (Prosser et al., 2008; Wachholtz and Gonzalez, 2014). Methadone patients with chronic pain may also have elevated inflammatory markers (specifically IFN-γ), which could increase their sensitivity to pain (Dennis et al., 2014). Finally, the origin of pain in OMT patients is diverse in nature (Dunn et al., 2014), which makes following specific clinical practice guidelines for pain treatment challenging, as many guidelines are written for specific pain conditions (e.g., lower back pain, fibromyalgia).

OMT patients may also experience unique challenges regarding the treatment of their chronic pain. Concurrent chronic pain and OUD has been associated with more severe medical and psychiatric problems, misuse of illicit substances, and poorer retention in OMT (Berg and Brevik, 1998; Jamison et al., 2000; Stack et al., 2000; Rosenblum et al., 2003; Trafton et al., 2004; Potter et al., 2015), and providers may prioritize the treatment of OUD in these patients, leaving the concurrent pain untreated (Berg et al., 2009). Opioid narcotic medications, which are first-line treatments for pain, may not be appropriate for OMT patients due to cross-tolerance (i.e., decreasing analgesic efficacy), or other medication interactions (e.g., increased risk of respiratory depression) in methadone patients or the antagonistic properties of buprenorphine. Many OMT patients report frustration with what they perceive to be inadequate treatment for their pain and that lack of treatment encourages them to use illicit opioids for pain relief (Karasz et al., 2004; St Marie, 2014). For instance, one study reported that 74% of methadone patients who had concurrent prescriptions for opioids to manage their pain had received those prescriptions from non-OMT providers (Nosyk et al., 2014). Thus, as a result of their pain not being addressed by their OMT providers, these patients may have put themselves at risk of relapse and overdose by seeking treatment on their own.

Given these complexities, it has been difficult to identify efficacious methods for treating concurrent pain in OMT patients. The first step toward identifying treatments is to understand OMT patient needs and current engagement in treatments. Previous characterizations of pain in OMT patients have been restricted to either methadone or buprenorphine-maintained patients, but not both. This study describes the results of a point-prevalence survey of chronic pain and coping strategies among patients maintained on methadone and buprenorphine for the treatment of OUD. The goal of this analysis is to identify opportunities for intervention that will help advance the treatment of pain among OMT patients, and to identify whether these strategies should be customized based upon OMT type.

2. Methods

2.1. Participants

Participants were recruited between 4/20/2012 and 2/10/2014 from primary methadone ($n = 3$ providers) and buprenorphine ($n = 5$ providers) OMTs in the Baltimore MD area. Providers were selected based on their status as a dedicated OMT (vs. primary care or medical clinic) with a large (≥50) OMT patient population. Individuals who were under 18 or were not receiving methadone or buprenorphine maintenance for OUD were excluded. A total of 201 individuals completed the survey; of these 8 answered "yes" to the quality control question "Have you completed this survey before"; 7 endorsed only acute but not chronic pain; 5 provided inconsistent data that prevented classification into a chronic pain category; and 2 did not indicate their OMT type; resulting in a final sample size of 179. This study was approved by the Johns Hopkins IRB and a waiver of informed consent was obtained.

2.2. Study procedures

Study staff members set up questionnaire stations and posted flyers in the OMTs that advertised a survey opportunity. Participants were compensated with $10 in cash or gift certificates, depending on clinic preference. To prevent participants from misrepresenting themselves for compensation, pain was not emphasized in any of the study advertising and participants were eligible to take the survey independent of current pain.

2.3. Study measures

2.3.1. Demographic questionnaire. Participants completed demographic, drug use, and past year pain treatment questions. Pain treatment was not operationalized and participants were not required to specify pain treatment type; therefore this item may represent a broad range of endorsements. Past 30-day self-reported illicit drug use and OMT dose were collected but omitted from the analyses due to a large portion of participants not answering those questions.

2.3.2. Medical diagnoses. Participants were provided a list of 61 medical problems that may underlie pain and were asked to indicate lifetime diagnoses. Ailments were categorized into groups representing cancer, cardiac, communicable diseases, dental, diabetes, gastrointestinal, physical impairment, psychiatric illness, reproductive illnesses, and respiratory illnesses. Endorsement of any item in a category was dichotomized (yes/no) for analyses.

2.3.3. Brief Pain Inventory. The BPI is a widely-used self-report instrument with good validity and reliability for the assessment of chronic pain severity and interference with daily life (Turk et al., 2003; Tan et al., 2004). Participants were asked whether they had experienced any pain today and whether that pain had existed for the past 3 months. To rule out exclusive opioid withdrawal-related pain, an item was included asking whether past 3-month pain was ONLY related to withdrawal; a total of 19 participants endorsed this item and were therefore categorized into the non-chronic pain group for analyses. To better operationalize the location of pain, participants were provided with a list of different body areas (e.g., upper back, lower back, legs) to select. Results from the BPI were summed into Severity and Total Interference summary scores (Dworkin et al., 2005). Individual severity items were also categorized as being mild (rating 0–4), moderate (rating 5–6), and severe (rating ≥7), consistent with recommendations for utilizing the BPI as a patient-reported outcome for clinical trials (Atkinson et al., 2010).

2.3.4. Coping checklist. Participants completed the self-report coping checklist developed by Barry et al. (2009a, 2010, 2012). The checklist presents 20 different pain coping strategies and asked participants to endorse strategies used in the past 3 months with a goal of treating ongoing pain that is not related to opioid withdrawal. This time frame was selected to correspond with the BPI. A total score was derived for each participant by summing the total number of strategies utilized.

2.3.5. Subjective opioid withdrawal scale (SOWS; Handelsman et al., 1987). The SOWS is a self-report instrument that asks participants to rate their level of current opioid withdrawal on 16 symptoms using a 5-point Likert scale (Not At All to Extremely). The SOWS was administered to provide a point-prevalence assessment of acute opioid withdrawal.

2.3.6. Symptom-checklist 10R (SCL-10R; Rosen et al., 2000). The SCL-10R is a brief self-report instrument derived from the SCL-90 that provides an assessment of past 30-day psychiatric functioning on a 5-point Likert (Not At All to Extremely). The SCL-10R was used to provide a point-prevalence assessment of current psychiatric impairment.

2.4. Data analysis

The primary goal of this study was to characterize pain severity, pain interference, and current engagement in coping strategies among OMT patients. Participants were dichotomized into those endorsing past 3-month chronic pain (CP) versus those endorsing no chronic pain (NCP), based on their response to the first question of the BPI. Demographic, drug use variables, SOWS ratings, incidence of medical problems, SCL-10R ratings, and current pain treatment were compared across the CP and NCP groups using independent groups Analysis of Variance (ANOVAs) and *t*-tests for continuous variables and Fisher's exact tests for categorical variables. A logistic regression was used to evaluate whether receiving treatment for pain was significantly associated with OMT type, gender, and age, since OMT is the variable of interest and age/gender have been shown in previous studies to be associated with differential treatment resources (Rosenblum et al., 2003; Dunn et al., 2014).

Results from the BPI and coping checklist were evaluated within the CP group only and compared as a function of OMT type (methadone vs. buprenorphine). Linear regressions were used to evaluate associations between OMT type and the BPI Severity and Interference total scores, covarying for variables that differed across