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Pain acceptance and opiate use disorders in addiction treatment patients with comorbid pain

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ABSTRACT

Objectives: Studies from pain treatment settings indicate that poor acceptance of pain may be an important and modifiable risk factor for higher severity of opioid use. However, the degree to which pain acceptance relates to opioid use severity in the addiction treatment population is unknown. In this study of addiction treatment patients with co-morbid pain, we examined correlates of severity of opiate (heroin and prescription opioid) use, with a particular focus on the role of pain acceptance.
Methods: Patients in residential addiction treatment with comorbid pain ($N = 501$) were stratified into low, moderate and high severity of opiate use. Demographic and clinical characteristics were compared across opiate severity categories.
Results: 72% ($N = 360$) of the participants had symptoms that were consistent with an opiate use disorder. Younger age, Caucasian race, female gender, cocaine use and lower pain acceptance were associated with higher severity of opiate use, whereas pain intensity was not. Controlling for demographic and other risk factors, such as substance use and pain intensity, higher pain acceptance was associated with lower odds of severe prescription opioid (AOR 0.50, 95% CI 0.38–0.68 for a one SD increase in pain acceptance) and heroin use (AOR 0.57, 95% CI 0.44–0.75 for a one SD increase in pain acceptance).
Conclusions: Problematic opiate use is common in addictions treatment patients with chronic pain. Lower pain acceptance is related to greater opiate use severity, and may be an important modifiable target for interventions to successfully treat both pain and opiate use disorders.

1. Introduction

Treating individuals with co-morbid chronic pain and substance use disorders presents a major challenge to clinicians and has become a nationally recognized target for improved care (Volkow and McLellan, 2011; Thomas et al., 2015). Substance use disorders in patients with chronic pain are common; a recent systematic review estimated past year prevalence between 3 and 48% and lifetime prevalence ranging from 16 to 74% (Morasco et al., 2011). Similarly, chronic pain is common in addiction treatment patients (Rosenblum et al., 2003; Brands et al., 2004; Wiest et al., 2014) and has been associated with poor treatment outcomes, including increased dropout from treatment and lower rates of abstinence post-treatment (Caldeiro et al., 2008; Larson et al., 2007). Substance use disorders, in particular opiate (heroin and prescription opioids) use disorders (OUD's), non-medical use of prescription opioids (NMUPO), and pain are also among the strongest risk factors for overdose and other opioid-related adverse outcomes (Hall et al., 2008; Britton et al., 2010; Johnson et al., 2012; Sehgal et al., 2012).

A number of studies in medical settings have identified individual clinical and demographic characteristics that are associated with greater likelihood of NMUPO and OUD in chronic non-cancer pain patients. For example, among Veterans receiving opioids for chronic non-cancer pain, younger age, male gender and other mental health disorders have been associated with increased risk for opioid abuse or dependence (Edlund et al., 2007). However, other studies in chronic pain patients comparing those with and without substance use disorders have shown mixed findings with these demographic and psychiatric factors (Morasco et al., 2011).

Several studies suggest that chronic pain patients' perceptions of increased impairments from pain are associated with increased risk for NMUPO or OUDs (Boscarino et al., 2010; Liebschutz et al., 2010), whereas there have been mixed results for pain intensity itself as a risk factor (Hoyt et al., 1994; Ives et al., 2006;

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Morasco and Dobscha, 2008; Morasco et al., 2013). Among psychological variables that are potentially modifiable, pain acceptance, defined as living with pain without "attempts to reduce or avoid it" (McCracken and Eccleston, 2003) has been identified as an important predictor of functioning in patients with chronic pain (Thompson and McCracken, 2011). A recent survey of university employees also found that those with highest risk for opioid misuse had less pain acceptance (Elander et al., 2014).

Although these prior studies provide important data about correlates and risk factors for NMUPO and OUDs in patient with chronic pain, an examination of these relationships in an addictions treatment setting has the potential to provide additional useful information for treating co-occurring pain and substance use disorders. Furthermore, individuals in this treatment setting with chronic pain are likely to have received opioids for their pain in the past, and are more likely to develop problematic opioid use than other patients with chronic pain. Consequently, it is useful to know what factors distinguish those who have developed opiate use problems from those who have not.

There have been few studies (Rosenblum et al., 2003; Trafton et al., 2004; Potter et al., 2008; Heimer et al., 2015) looking at characteristics associated with chronic pain in addiction treatment samples and, to the best of our knowledge, no studies examining association of pain acceptance with opioid use in addiction treatment patients. A recent study by Weiss et al. examining reasons for prescription opioid use among opioid dependent patients with and without chronic pain found that those with chronic pain reported different reasons for use and were more likely to report coping with pain over social reasons for using (Weiss et al., 2014). This suggests that patients with lower pain acceptance and higher avoidance would be more likely use opioids, not only to treat subjective levels of pain, but also to treat distress from feeling that they are unable to function due to pain. The analgesic effect of opiates could result in an association between poorer pain acceptance and greater severity of opiate use that is above and beyond use of other substances. Furthermore, the association of pain acceptance may differ between prescription opioid use problems and heroin use problems, given the unique clinical context of prescription opioids in pain treatment. Understanding whether the relationship between poor pain acceptance and substance use severity is unique to prescription opioids could help inform treatments for individuals with comorbid pain and addiction.

In this study, we examined a high-risk sample of patients receiving residential addiction treatment who have co-morbid pain. We assessed correlates of severity of OUDs, including demographic and psychiatric factors, and specifically looked at the impact of pain acceptance. Given that the nature of the relationship between factors related to pain may be different between users of heroin and prescription opioids, we assessed factors related to the severity of use of these types of opiates separately.

2. Methods

2.1. Participants and procedures

Data come from a sample of adults recruited at a large residential addiction treatment program in southeastern Michigan from October, 2011 to July, 2014. This treatment program serves clients from across the state of Michigan, including urban, suburban, and rural areas. All clients over the age of 18 receiving services at the treatment site were eligible to participate in the screening portion of the study, which included a 20-min survey in which participants were asked questions related to demographic characteristics, pain level, and other medical and psychosocial characteristics.

Those who met criteria for moderate to severe chronic pain on the self-report screening survey (as measured by an average rating of the participant's usual and worst pain over the prior 3 months of 5 or greater on the Numeric Rating Scale of Pain Intensity [NRS-I]) and who completed intake assessment at the treatment site within the previous 60 days were eligible to participate in a randomized controlled trial assessing the impact of CBT on treatment of comorbid pain and addiction. Patients who endorsed acute suicidality or psychoses, or those unable to provide written consent were excluded from participation. This constituted the baseline sample of 510 individuals who are included in these analyses. For these analyses, we limited the sample to all of those who had complete data on both of the main dependent variables (prescription opioid use severity and heroin use severity; $N = 501$).

All participants included in this study provided written consent and completed a baseline assessment at the study site. Data from the baseline and screening surveys were combined and used in the current analyses. All study procedures were approved by the University of Michigan Medical School Institutional Review Board.

2.2. Measures

The baseline assessment consisted of questions that measured acceptance of pain, mental and physical health functioning, and past experiences with alcohol and other drugs.

2.2.1. Pain level. Pain intensity over the past 3 months was assessed using the Numeric Rating Scale of Pain Intensity (NRS-I; Farrar et al., 2001), an 11-point numeric rating scale ranging from 0 (*no pain at all*) to 10 (*worst pain imaginable*). This measure has external validity and can detect clinically meaningful changes in subjective measure of pain intensity (Farrar et al., 2001). Participants were asked to provide ratings on both their usual pain over the past 3 months, as well as their worst pain over that time period. Pain scores were calculated based on the average of those two items.

2.2.2. Pain acceptance. The Chronic Pain Acceptance Questionnaire (CPAQ; McCracken et al., 2004; Vowles et al., 2008) is a well-validated 20-item measure of acceptance of pain. The scale had a standardized Cronbach's alpha of 0.87 in the present sample. Items utilize a Likert-type scale with answer choices ranging from 0 (never true) to 6 (always true). In addition to a total score, the CPAQ yields separate factor scores for activity engagement and pain willingness. The activity engagement subscale utilizes 11 items that focus on the degree to which the participant engages in different life activities despite the presence of pain. The pain willingness subscale uses 9 items to capture the participant's willingness to avoid engaging in behaviors that limit contact with pain. Both subscales were included in descriptive analyses, but the total scale was included in the multivariable regression due to correlation between the subscales (McCracken et al., 2004).

2.2.3. Substance use. Severity of substance use was assessed using the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST), a self-report measure that detects substance use and related problems (WHO ASSIST Working Group, 2002; Humeniuk et al., 2008). The ASSIST was modified to specifically use the term "heroin" instead of "street opiates" in order to avoid confusion with prescription opioids obtained from non-medical sources. In this analysis, participants were categorized based on their ASSIST scores on prescription opioid and heroin questions into the following categories based on previously defined validated cutoff scores: low (score 0–3), moderate (score 4–26), and high (score $\geq$27) severity of use (Humeniuk et al., 2008). Participants in the "low" category included non-users of that substance. As reflected in the DSM-5 conceptualization of substance use disorders (Hasin et al., 2013), diagnoses no longer reflect presence or absence of abuse or dependence as distinct categories, but now reflect severity of the disorder on a continuum (Martin et al., 2008) based on symptoms and functional impact demarcated with diagnostic thresholds. The ASSIST uses a similar continuum approach and this was used to group patients based on levels of severity of opiate use problems. Prescription opioid use severity and heroin use severity were examined separately for the primary analyses in this study. As a measure of other substance use, presence or absence of past 3 month use of alcohol, cocaine and marijuana use were included as potential correlates of severity of opiate use.

2.2.4. Depression. Depression was assessed using the Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001), a nine-item measure of depressive symptoms. Participants were asked to rate on a four-point scale from 0 (*not at all*) to 3 (*nearly every day*) how often each of the symptoms bothered them during the past two weeks.

2.3. Data analyses

Patients were divided into low, moderate, and high severity of opiate use based on the ASSIST. Demographic characteristics were evaluated using the entire sample. Primary analyses were further sub-divided into severity levels for heroin and prescription opioid use separately. Bivariate comparisons of demographic and clinical characteristics were assessed across these severity categories using Cochran–Mantel–Haenszel chi-square tests for categorical variables and the Wilcoxon signed-rank test (two-sided) for continuous variables. Multivariable logistic regression was used to examine the joint relationships of demographic and clinical characteristics with the severity categories for prescription opioid use and heroin use. The generalized logit approach was applied to all models. Relevant demographic and clinical characteristics that were significantly different across groups were included as independent variables in the regression models. Pain acceptance was entered as a standardized value (to its mean and standard deviation) to improve