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Personality Factors Associated with Methadone Maintenance Dose

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Abstract: *Objectives:* Methadone is the most frequently prescribed medication for the treatment of opioid dependence in the U.S., and questions relating to appropriate dosing of methadone remain an important issue. Given accumulating evidence suggesting an elevated prevalence of personality pathology in opioid dependent populations, as well as evidence of an association between Cluster B characteristics and substance use severity, we hypothesized that patients with such pathology would have elevated methadone dose prescriptions. *Methods:* Participants were 54 opioid dependent individuals recruited from a methadone maintenance clinic. *Results:* Results indicated that participants with symptoms consistent with Cluster B pathology had a significantly higher mean prescribed methadone dose relative to participants without Cluster B pathology. *Conclusion:* The presence of personality traits appears to influence methadone maintenance. Implications of this finding are discussed.

Keywords: Cluster B, methadone maintenance, opioid dependence, personality factors

INTRODUCTION

Among individuals diagnosed with substance use disorders, rates of comorbidity with Axis II disorders are exceedingly high. Findings from the National Epidemiologic Survey on Alcohol and Related Conditions indicate that the rate of co-occurring drug use disorders and personality disorders (PDs) is 47.7% (1). Rates are particularly elevated for certain disorders, such as antisocial PD (1) and borderline PD (2, 3). Further, the presence of comorbid PDs has been associated with higher levels of reported distress (4), poorer overall mental health (5), treatment attrition, and poor treatment outcome (6), highlighting this as an important factor in the treatment of substance use disorders.

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Recently, research has focused on the comorbidity between substance use disorders and the Cluster B (antisocial, histrionic, narcissistic, and borderline) PDs. These disorders may have a shared vulnerability due to several areas of overlap, including elevated sensation-seeking/impulsivity (7, 8) and distress intolerance. High levels of distress intolerance have been noted both in the Cluster B PDs (9) and substance use disorders (10). Further, this may have negative implications for treatment retention (11) and outcome (12, 13).

Although several treatment implications for the comorbidity between Cluster B PDs and substance use disorders have been identified, one potentially overlooked area is in regards to treatment seeking practices. Methadone maintenance treatment (MMT) is among the most common interventions for individuals with opioid dependence. Of particular importance to the effectiveness of MMT is dosing procedures. In addition to its impact on effectiveness, dosing may impact quality of life in both positive ways (e.g., improving withdrawal and craving symptoms) and negative ways (e.g., side effects). Dosing of methadone is influenced by many factors and can be complex due to significant individual variability (14, 15). The goal of MMT is to achieve a dose at which drug cravings and withdrawal symptoms are suppressed and cross-tolerance to other opioids is achieved (14). Use of a sufficiently high dose of methadone has been shown to lead to improved substance use outcomes (16) and treatment retention (17). Several factors may be considered in finding appropriate methadone dose including patient self-report of symptoms, drug use screens, and measurement of methadone levels in the blood (14). Because patient self-report provides information about symptoms which may not be achievable through other means, this can become an important variable in dosing procedures.

This reliance on self report introduces tremendous variability in treatment. Distress tolerance may be of particular importance for understanding treatment requests. The elevated level of distress intolerance among individuals with co-occurring Cluster B PDs and opioid dependence may impact dosing levels because a low ability to tolerate physical and psychological cravings may lead to requests for higher methadone doses relative to those with greater ability to tolerate distress. Thus, individuals with similar addiction severity may present discrepant subjective reports based on levels of comorbid pathology. Due to the importance of dosing in MMT to both treatment effectiveness and quality of life, factors other than severity that influence dosing may have important implications for treatment.

The present study was designed to examine the relationship between personality disorder pathology and the prescribed dose of methadone among individuals receiving methadone maintenance treatment for opioid dependence. Based on expectations of poorer distress tolerance among those individuals with Cluster B PDs, we hypothesized that individuals with Cluster B personality pathology would have elevated doses of methadone relative to those without such pathology.

MATERIALS AND METHODS

Participants

Fifty-four participants were recruited from an urban methadone maintenance clinic as part of a randomized clinical trial comparing two outpatient psychological interventions for reducing use of illicit drugs. Participants were included in the study if they met *DSM-IV* (18) criteria for opioid dependence, were currently using illicit drugs, maintained a stable dose of methadone, and met criteria for chronic stress. Exclusion criteria included diagnosis of a psychotic or organic mental disorder, uncontrolled bipolar disorder, and an unstable medical illness that would interfere with participation in treatment.

The sample used in this analysis was 56% male (n = 30). The mean age of the sample was 44.2 years (SD = 8.86). The sample was 48% White (n = 26), 39% Black (n = 21), 9.3% Hispanic (n = 5), and 3.7% Asian/Pacific Islander (n = 2). The mean dose of methadone was 87.11 mg (SD = 49.78), and mean body mass index (BMI) was 26.62 kg/m^2 (SD = 3.71). The mean Addiction Severity Index (ASI) drug and alcohol use composite score was .24 (SD = .16).

Procedures

After providing informed consent to participate in the larger randomized clinical trial, potential participants were screened to determine eligibility. Eligible participants completed a baseline assessment which included self-report and clinician-administered measures that assessed severity of substance use and personality characteristics.

Study Measures

Addiction Severity Index (ASI) (19).

The ASI is a semi-structured clinical interview which measures the severity of problems in seven areas of functioning that are frequently affected in patients with substance use disorders. Composite scores are calculated for each area to provide an overall rating of severity for the 30 days prior to test administration. The psychometric properties of the ASI have been extensively studied in diverse populations, and these analyses demonstrated strong retest reliability and concurrent, predictive, and discriminate validities (20).

Personality Diagnostic Questionnaire-4 (PDQ-4) (21).

The PDQ-4 is a self-administered questionnaire comprised of 85 true-false questions that generates analogue personality diagnoses consistent with the

DSM-IV diagnostic criteria for Axis II disorders. The reliability and validity of earlier versions of the PDQ-4 have been studied to a large extent, although less attention has focused on the reliability and validity of the current version of the measure. Retest reliability for the PDQ-4 has been investigated and ranges from .48 to .79 (22). In all cases, categorical data (e.g., Cluster B disorder present vs. absent) was utilized for analyses.

Body Mass Index (BMI).

BMI is a reliable indicator of body fatness as it correlates to direct measures of body fat. BMI is calculated based on a person's weight and height. The formula is: (weight (lbs) × 703)/height (in)^2 (23).

Design and Statistical Analysis

Before examining the primary hypothesis, patients with Cluster A, B, and C personality pathology and patients without Cluster A, B, and C personality pathology were compared for any differences in sociodemographic data, addiction history, and BMI with the use of chi-square analysis for categorical variables and an independent samples t-test for continuous variables.

A number of linear regression analyses were used to assess the impact of the presence of Cluster B pathology on methadone dose. First, the predictive significance of Cluster B pathology was examined alone and then examined in relation to the prediction afforded by consideration of Clusters A and C. Second, the predictive significance of Cluster B pathology was evaluated relative to confounding effects of weight (BMI) and substance use severity.

RESULTS

Sixty-eight percent (n = 37) of participants endorsed symptoms consistent with at least one personality disorder. Of the sample, 61% (n = 33) endorsed symptoms consistent with Cluster A, 50% (n = 27) with Cluster B, and 54% (n = 29) with Cluster C. In addition, 41% (n = 22) endorsed symptoms consistent with all three personality disorder clusters. Within the Cluster B personality disorders, 37% (n = 20) endorsed symptoms consistent with a diagnosis of antisocial PD, 31.5% (n = 17) with borderline PD, 5.6% (n = 3) with histrionic PD, and 20.4% (n = 11) with narcissistic PD.

No differences were detected between participants meeting criteria for at least one personality disorder compared to participants without a personality disorder for sociodemographic variables, severity of substance use, or BMI. Further, no significant differences were detected for participants with and without Cluster A personality pathology and those with and without Cluster C

pathology. No differences were detected for age, race, gender, and substance use severity for participants with and without Cluster B personality pathology; however, a significant difference was detected for BMI. Patients with Cluster B personality pathology had a significantly higher BMI (mean = 28.0 kg/m², SD = 3.3) compared to patients without Cluster B pathology (mean = 25.3 kg/m², SD = 3.71, F(1, 51) = 7.8, p < .01).

The presence of Cluster B personality pathology was significantly predictive of methadone dose (ß = .31, F (1, 53) = 5.33, p < .05). Those with Cluster B pathology had a mean methadone dose of 102.2 mg (SD = 53.97) compared to 72.1 mg (SD = 40.87) for those without Cluster B pathology. In the regression evaluating the relative importance of Cluster A and C pathology, only Cluster B entered the regression equation when subjected to a hierarchical analysis (Cluster A: ß =.02, p = .92; Cluster C: ß = −.18, p = .4). Moreover, when controlling for severity of substance use disorder (ASI composite score) and BMI, severity (ß = -.28, p < .05), but not BMI, offered significant predictability, and Cluster B pathology continued to offer significant predictability over both of these covariates (ß = .33, p < .05).

DISCUSSION

The finding of high prevalence rates of personality disorders in a sample seeking methadone maintenance treatment is consistent with previous studies (24, 25). As hypothesized, methadone dose was linked to the presence of Cluster B personality pathology and was associated with a 30.1 mg greater dose relative to those without this pathology. This difference was not a result of differences in drug use severity or body weight.

Methadone dose may be uniquely related to Cluster B pathology because of the association of sensation seeking, impulsivity, and distress intolerance traits with this cluster of personality disorders. Regardless of the reason for the association, our findings suggest that methadone dosing is responsive to the type of distress or need communicated by patients with Cluster B pathology in a manner that is independent of their drug use patterns, at least as operationalized by ASI composite scores.

The sample included in this study represents a population with severe psychopathology, which may limit the generalizability of the findings. Participants were treatment refractory and were included in the study only if active substance use was detected after receiving MMT for at least four months. Consistent with numerous findings documenting increased prevalence rates of PD in substance use disorder populations, the sample examined in this investigation likewise evidenced very high PD prevalence rates. However, approximately two-thirds of our sample endorsed at least one PD, in comparison with approximately 50% prevalence rates documented in other studies. The increased prevalence rate of PD in our sample may be explained by the positive predictive power of

the PDQ-4, which has shown high false positive rates (i.e., many individuals classified by the PDQ-4 as having personality pathology in fact do not meet the diagnostic criteria for those disorders according to gold standard diagnoses) (26).

Additionally, our cross sectional design introduces the possibility that the comorbid group (substance use disorder and PD) had greater substance use disorder severity at baseline when the initial dosage of methadone was determined. A more severe substance use disorder could have resulted in a higher prescribed methadone dose in order to achieve similar levels of improvement relative to the non-comorbid group. This rival hypothesis to explain our findings cannot be ruled out by the study's design.

Given the noted limitations of this study, evaluating the relationship between personality characteristics and methadone dose, when controlling for severity of substance use disorder at the initiation of prescribed methadone, would clarify the role of PD in methadone dosing. In addition, previous research indicates that distress intolerance is an underlying factor associated with Cluster B personality pathology.

In summary, our study investigated understudied factors that influence dosing for the most commonly prescribed treatment for opioid dependence. Cluster B pathology, which is associated with sensation seeking and impulsivity as well as distress intolerance, is related to elevated prescribed methadone maintenance dosage. The results of this investigation indicate that personality pathology (in particular Cluster B disorders) may be important factors to consider in treatment planning. These preliminary findings suggest that additional research to clarify the role of these factors and their relationship to methadone dose is warranted.

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