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Self-report of illicit benzodiazepine use on the Addiction Severity Index predicts treatment outcome

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Abstract

The relationship between pre-treatment illicit benzodiazepine use (days of use in the last 30) assessed on the Addiction Severity Index (ASI) and treatment outcome was investigated by retrospective analysis of data from two controlled clinical trials in 361 methadone maintained cocaine/opiate users randomly assigned to 12-week voucher- or prize-based contingency management (CM) or control interventions. Based on screening ASI, participants were identified as non-users (BZD-N; 0 days of use) or users (BZD-U; >0 days of use). Outcome measures were: urine drug screens (thrice weekly); quality of life and self-reported HIV-risk behaviors (every 2 weeks); and current DSM-IV diagnosis of cocaine and heroin dependence (study exit). In the CM group, BZD-U had significantly worse outcomes on in-treatment cocaine use, quality-of-life scores, needle-sharing behaviors, and current heroin dependence diagnoses at study exit compared to BZD-N. In the control group, BZD-U had significantly higher in-treatment cocaine use but did not differ from BZD-N on psychosocial measures. Thus, in a sample of non-dependent BZD users, self-reported illicit BZD use on the ASI, even at low levels, predicted worse outcome on cocaine use and blunted response to CM.
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Keywords: Contingency management; Cocaine abuse; Heroin abuse; Opiate; Benzodiazepine

1. Introduction

Opiate and cocaine dependence are highly responsive to contingency management (CM), a behavioral therapy in which abstinence (usually as measured by drug-negative biological specimens) is reinforced by the delivery of a monetary voucher, an opportunity to draw for a prize, or some other desired item or privilege (Higgins et al., 1991; Silverman et al., 1996, 1998; Bigelow et al., 1998; Piotrowski et al., 1999; Downey et al., 2000; Higgins et al., 2000; Kellogg et al., 2005). CM has been particularly useful in decreasing the use of cocaine in patients in methadone maintenance (Piotrowski et al., 1999; Silverman et al., 1998, 2004). Although methadone maintenance is a very effective treatment for opioid dependence, continued use of non-opioid drugs during treatment is a significant problem for many patients (Bleich et al., 2002; Drake et al., 1993; Stitzer et al., 1992). Co-ingestion of benzodiazepines (BZDs) and methadone augments the physiological and subjective opioid effects of methadone (Preston et al., 1984; Lintzeris et al., 2006), and methadone-maintenance patients have high rates of BZD abuse (Stitzer et al., 1981; Darke, 1994; Gossop et al., 2003). BZD use among injecting drug users has been associated with poorer psychosocial functioning, greater levels of polydrug use, and greater likelihood of HIV risk-taking behaviors (Darke et al., 1992; Drake et al., 1993; Darke, 1994; Chutuape et al., 1997; Bleich et al., 1999, 2002; Gelkopf et al., 1999). However, it is not clear whether BZD use in methadone-maintenance patients affects their response to behavioral treatments designed to reduce use of other illicit drugs, such as CM for cocaine use. We have previously shown that treatment outcome in methadone-maintenance patients is not affected by cannabis use, as measured by the presence of cannabis-positive urine drug screens during treatment, in the absence of symptoms of cannabis dependence (Epstein and Preston, 2003).

In the present study, we evaluated whether treatment outcome was predicted by patients' illicit benzodiazepine use in the 30 days prior to intake, as reported on the Addiction Severity Index

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(ASI) (McLellan et al., 1985), a standard assessment instrument widely used in both treatment and research. The following outcome measures were evaluated: (1) rates of cocaine or opiate use during treatment, (2) DSM-IV diagnoses of heroin or cocaine dependence at the end of treatment, (3) quality-of-life measures during treatment, and (4) HIV-risk behaviors during treatment. These outcome measures were assessed with validated instruments (Weissman et al., 1978, 1981; Goldman et al., 1992). They have been shown to be important indicators of treatment success (Sorensen and Copeland, 2000; Teichner et al., 2001; Hudson et al., 2002; Kampman et al., 2004). To have adequate statistical power, we combined data from two of our clinical trials evaluating the efficacy of CM for heroin/cocaine abuse (Epstein et al., 2003; Ghitza et al., 2007, 2008). Each participant was enrolled in only one of the clinical trials. The first clinical trial used a CM procedure involving vouchers ($N = 252$), and the second clinical trial used a CM procedure involving prize-draws ($N = 109$). The BZD users in these studies were not individuals whose use rose to the level of physical dependence or who were seeking treatment for BZD abuse; such individuals would have been excluded during screening and referred for other treatment. Thus, the question of interest was whether treatment outcome was predicted by self-report of even relatively low levels of illicit BZD use.

2. Methods

2.1. Study participants

The clinical trials in which we collected our data were approved by the local Institutional Review Board for human research and conducted at an outpatient inner-city treatment research clinic in Baltimore, MD between June 1999 and August 2005. Participants were recruited through advertisements in local newspapers and on television stations selected to ensure exposure to both sexes and all ethnicities in order to maximize generalizability (external validity). Participants gave informed written consent prior to participation. Participant screening included: medical, psychiatric, and drug-use histories; physical examination; standard laboratory screens; a battery of assessment instruments, including the ASI and the Diagnostic Interview Schedule (DIS-IV) (Robins et al., 1995). Eligibility criteria for enrollment in the study were: age 18–65, cocaine and opiate use (by self-report and urine screen), and physical dependence on opiates. Current DSM-IV diagnoses of heroin or cocaine dependence were not required. Exclusion criteria were: current psychotic, bipolar, or major depressive disorders; unstable serious medical illness; estimated IQ below 80 (Shipley Institute of Living Scale) (Zachary, 1986); urologic conditions that precluded urine collection; and current physical dependence on alcohol or sedatives as assessed by DIS-IV responses and clinical judgment (e.g., ability to provide a benzodiazepine-negative urine specimen without evincing signs of withdrawal). This exclusion criterion restricts the current sample to relatively nonproblematic users of benzodiazepines.

For analyses reported here, participants were classified as benzodiazepine users (BZD-U) if they reported at least 1 day of illicit or non-prescribed use in the last 30 days prior to treatment admission on the screening ASI. Participants who did not report BZD use over that time period were classified as benzodiazepine non-users (BZD-N). This nomenclature will be used throughout this paper; note that it refers only to pre-treatment self-reported use and not to in-treatment use of BZDs: not all BZD-U tested positive for BZDs during the study, and some BZD-N tested positive.

2.2. Study procedure

The study consisted of a 5-week baseline treatment period, a 12-week experimental (CM or control) intervention period, and an 8-week Post-Intervention period (i.e., a return to baseline conditions). Throughout the 25-week study, all participants received, without charge, daily methadone (70–100 mg/day) and weekly individual counseling and provided urine specimens under observation three times per week, usually Mondays, Wednesdays, and Fridays. Urine drug testing was conducted with an Enzyme Multiplied Immunoassay Technique (EMIT; Syva Corp., Palo Alto, California) system that provided qualitative results for cocaine (benzoylecgonine equivalents; BZE), opiates (morphine), marijuana, and benzodiazepines (oxazepam). Cutoffs were 300 ng/ml for cocaine, opiates, and benzodiazepines, and 50 ng/ml for marijuana. Breath alcohol was determined with an Alco-Sensor III (Intoximeters, Inc., St. Louis, MO).

At the end of a 5-week baseline period, participants whose urine specimens tested positive for heroin and cocaine (not necessarily on the same days) on at least four of 15 occasions were randomized to a contingency management or control intervention. Randomization was done by a technician who used a Microsoft Excel macro that stratified randomization by race, sex, employment status, probation status, and frequency of opiate- and cocaine-positive urine specimens during baseline. Group assignment in the clinical trials was unequal to maximize statistical power for pairwise comparisons of interest (Woods et al., 1998; Dumville et al., 2006). Because of the nature of the intervention, blinding of these conditions was not possible.

During the 12-week intervention, in addition to the EMIT testing, urine specimens from all participants were tested for the presence of cocaine metabolite (BE) and opiates (morphine) with an onsite dipstick-type drug screen (OnTrak TesTstik, Varian Products) that gave results in less than 15 min. All participants were told the results of these tests during the clinic visit. Participants in the CM condition earned either vouchers with monetary value or opportunities to draw for prizes for each negative cocaine screen ($N = 97$). Some participants also received incentives for opioid abstinence ($N = 165$). BZD use had no formal positive or negative consequences within the research design or clinic program. Participants in the control condition ($N = 99$) received vouchers or opportunities to draw for prizes independent of urine-test results, i.e., noncontingently, according to a schedule matched to earnings of participants in the CM groups. Prior studies have shown that delivery of noncontingent vouchers does not increase drug use (Schroeder et al., 2003). The voucher procedure was modeled after the method developed by Higgins and colleagues (Higgins et al., 1991; Silverman et al., 1996) Vouchers were given on the day they were earned (CM groups) or scheduled (noncontingent control groups); accrued vouchers were exchanged for goods and services that were consistent with a drug-free lifestyle and patients' treatment goals, as described previously (Preston et al., 2002). The prize-based-reinforcement schedule was modeled after the method of Petry and Martin (2002). Draws for prizes were made on the day they were earned (CM groups) or scheduled (noncontingent control groups); prizes were available on site for immediate dispensation.

Measures of psychosocial functioning were collected during and at the end of treatment. Quality of life was assessed with the Social Adjustment Scale–Self-Report (SAS-SR) (Weissman and Bothwell, 1976) at baseline and every 2 weeks throughout treatment. The SAS-SR is a widely used questionnaire with acceptable psychometric properties; it has good test-retest reliability, and its validity has been supported by robust intercorrelations among ratings by participants and interviewers in a wide variety of research and clinical contexts (Weissman et al., 1978, 1981; Goldman et al., 1992). It measures adjustment and performance over the past 2 weeks in seven major areas of social functioning using seven individual subscales: work, social and leisure activities, relationship with extended family, parental role, marital role as a spouse, membership in the family unit, and financial status (Weissman and Bothwell, 1976). Each of the items on the SAS-SR is rated on a 5-point scale with 1 = no impairment in social functioning and 5 = greatest impairment in social functioning.

DSM-IV diagnoses of heroin or cocaine dependence at study exit were generated using the Substance Dependence Severity Scale (SDSS), a semistructured clinical interview consisting of items keyed to each criterion for DSM-IV dependence and abuse, covering the preceding 30 days (Miele et al., 2000).

Measures of HIV risk were collected every 2 weeks throughout the study using the HIV Risk-Taking Behavior Scale (HRTBS) (Darke et al., 1991). Participants completed the HRTBS in written questionnaire form at 2-week intervals, from intake up until week 30. This instrument has been shown to have satisfactory psychometric properties for measuring HIV-risk behaviors in substance abusers (Petry, 2001).