



Effect of traumatic event reexposure and PTSD on substance use disorder treatment response



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ABSTRACT

Background: A remarkably high rate of traumatic event reexposure has been demonstrated in community-based substance users which negatively impacts their substance use disorder (SUD). The rate and effect of such reexposure in treatment is unknown. Despite increasing evidence that a diagnosis of posttraumatic stress disorder (PTSD) has little influence on long-term SUD treatment outcomes, it is possible that PTSD symptom fluctuations could have effects.

Methods: This prospective longitudinal study examined the rate and effect of traumatic event reexposure and PTSD symptoms in 169 male and female methadone maintenance patients with a comorbid psychiatric disorder who were participating in a parent study. Traumatic events and PTSD symptoms were tested for association with drug use, treatment interruption, and counseling adherence in the same month, one month later, and two months later.

Results: Approximately 18% of patients were reexposed to a traumatic event each month during the 12-month study. Reexposure was associated with about twice the risk of treatment interruption in the same month and one month later. Every 10% increase in PTSD symptom severity was associated with a 36% increased risk of treatment interruption two months later. No effects were seen on drug use or counseling adherence.

Conclusions: SUD patients have a relatively high rate of traumatic event reexposure. Both traumatic events and PTSD symptoms are associated with increased risk of treatment interruption, resulting in SUD patients leaving treatment at precisely the time they could benefit from treatment support.

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1. Introduction

Both traumatic events and subsequent posttraumatic stress disorder (PTSD) have significant and serious effects in substance use disorder (SUD) patients. Nearly all SUD patients have a history of traumatic events, which have been associated with a number of negative sequelae including poorer mental and physical health (Gilbert et al., 2015) and a risk of developing PTSD and other psychiatric disorders (Green et al., 2010). An important but often overlooked outcome in SUD patients is the potential for traumatic event reexposure or revictimization. Our previous work documented that 27% of active injecting substance users with little treatment contact experienced a new traumatic event each month (Peirce et al., 2012). Although these men and women were

polysubstance users, nearly all injected heroin. Risk factors for reexposure in substance users and non-users alike include psychiatric treatment history and past traumatic event exposure, among others (Breslau et al., 1995; Cohen et al., 2013; Peirce et al., 2014). Reexposure in the above SUD sample was associated with an increased risk of later drug use and a desire for SUD treatment, without a corresponding increase in treatment enrollment (Peirce et al., 2013). The rate of traumatic event reexposure is unknown in SUD patients enrolled in treatment, nor is there data to determine the potential effect of such reexposure on treatment outcomes.

PTSD is comparatively well-studied in SUD patients. One-quarter to one-third of SUD patients in treatment meet diagnostic criteria for current PTSD, which has been consistently associated with greater psychiatric distress, poor social support, and poor physical health in mixed drug users (Driessen et al., 2008; Reynolds et al., 2005) and opioid users (Mills et al., 2005, 2007; Peirce et al., 2009). Studies on the relationship between PTSD and SUD treatment outcomes have had mixed results. Although early work suggested PTSD was associated with more in-treatment drug use or

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faster relapse to drug use in mixed samples (Brown et al., 1996) and in opioid users (Hien et al., 2000), more recent prospective studies have failed to find this relationship in mixed samples (Norman et al., 2010) and in opioid users (Mills et al., 2007; Trafton et al., 2006). A recent review concluded that a diagnosis of PTSD does not consistently affect SUD treatment outcomes (Hildebrand et al., 2014). However, the clinical belief that PTSD does negatively affect SUD treatment response persists. As most studies in this area diagnose PTSD at one time (usually treatment entry) and measure outcomes months or years later, it is possible that more frequent assessments of PTSD symptoms and SUD outcomes would identify a significant and more dynamic relationship between PTSD and SUD. This possibility is supported by studies in which a diagnosis of PTSD made at treatment entry had no relationship to SUD outcomes but PTSD that remained symptomatic predicted worse outcomes, although these studies had only a minority of opioid users (Ouimette et al., 2007; Read et al., 2004). Much of the literature on outcomes has focused on psychosocial-only treatment settings and more data is needed on patients in medication-assisted treatment, especially considering opioid users' higher risk of traumatic events and PTSD (Dabbs et al., 2014; Meier et al., 2014). Given the reexposure risk associated with psychiatric treatment history in active substance users, SUD patients with a comorbid psychiatric disorder could be a high-risk subgroup worthy of increased focus.

The present study was designed to address these gaps in the literature. First, we wished to document the rate of traumatic event reexposure in a sample of SUD patients comorbid for another psychiatric disorder and enrolled in methadone maintenance. We expected that the rate would be non-trivial, but likely lower than that found in our previous work with active injecting drug users. Second, we examined the relationship of any traumatic event reexposure and qualitatively different types of traumatic events to the specific treatment outcomes of drug use, treatment interruption, and counseling adherence over short proximal time frames. We expected that traumatic event exposure, and more severe types of traumatic events in particular, would be associated with poorer SUD treatment response. Third, we evaluated the relationship of PTSD symptom severity to these same outcomes. We expected that PTSD severity would not be associated with SUD treatment outcomes.

2. Materials and methods

2.1. Participants

Study participants were drawn from a parent study comparing integrated onsite psychiatric care to offsite care for substance abusers enrolled in methadone maintenance treatment (Brooner et al., 2013). Inclusion criteria for the parent study were: (1) current opioid dependence and enrolled in the methadone maintenance treatment setting; (2) current comorbid psychiatric disorder; and (3) willingness to receive psychiatric care. See Brooner et al. (2013) for complete information. The traumatic event and PTSD symptom assessments were added to the parent study after it was underway. No inclusion or exclusion criteria were added or modified for the present study. Of 316 randomized participants in the parent study, 169 received the present study measures. Comparison of the 147 participants excluded from the present study with the 169 included participants on several demographic, psychiatric, and drug use characteristics found no significant differences. The present report focuses on the substance abuse treatment outcomes and does not include the psychiatric treatment outcomes.

2.2. Measures

Sample characteristics were measured with a purpose-made demographic questionnaire, administered at entry into the study. The Structured Clinical Interview for DSM-IV (SCID; First et al., 1998) was administered at study entry to assess lifetime and current psychiatric disorders, including posttraumatic stress disorder (PTSD). Follow ups were scheduled monthly while the participant remained in treatment.

2.2.1. Traumatic events and PTSD symptoms. The Traumatic Life Events Questionnaire (TLEQ; Kubany et al., 2000) was administered at study entry to document lifetime exposure to traumatic events and monthly thereafter to assess exposure to

new events. The TLEQ probes for exposure to 22 specific potential traumatic events and a 23rd 'other' category, as defined in the DSM-IV-TR criteria for PTSD (American Psychiatric Association, 2000). These probes are followed by questions to determine whether the event meets DSM-IV-TR criterion A(2) (i.e., a response of extreme fear, helplessness or horror); all events reported here met criterion A(2). We note that this standard is more restrictive than that for the current DSM-V (American Psychiatric Association, 2013). The TLEQ is considered a 'gold standard' in traumatic event assessments (Gray et al., 2004; Weathers and Keane, 2007), and appears to detect traumatic events better than other measures in SUD populations (Peirce et al., 2009). Similar types of lifetime events were grouped together for concise presentation. Specifically, physical assault with and without weapon were grouped into "physical assault;" motor vehicle accidents and other types of accidents were grouped into "accident;" sexual harassment and stalking were grouped into "other threats;" and abortion, miscarriage, and other events were grouped into "other events."

The TLEQ was also administered at monthly follow-ups, for a total of 1242 administrations. It was modified for follow-up administration by removing event probes for childhood events and prefacing each remaining event probe with 'In the past 30 days. . .'. For the main analyses, the TLEQ provided a dichotomous measure of traumatic event re-exposure in a given month (exposure to any type of event versus no exposure). A second set of analyses examined the specific effects of any death or injury of loved one (defined as unexpected death of loved one or illness/injury of loved one) and any assault (defined as physical or sexual assault) on the same treatment outcomes.

The Modified Posttraumatic Stress Scale-Revised (MPSS-R; Falsetti et al., 1993) was used to assess current PTSD symptoms at follow-up months 4, 8 and 12; it was administered 271 times. It consists of 17 questions targeted to the 17 DSM-IV-TR symptoms, with scales to rate frequency (0–3) and severity (0–4) of each symptom, which are summed for a total severity score. The MPSS-R has shown good reliability and validity in SUD populations (Coffey et al., 1998). The total severity score (range 0–119) was recoded into deciles (range 1–10) to facilitate the interpretation of results, so that the outcomes are expressed as a function of a 10% increase in PTSD symptom severity. Participants scored in the lower deciles more frequently, but all deciles were populated. The MPSS-R was also used for a putative PTSD diagnosis, defined as meeting criteria for 1 reexperiencing, 3 avoidance/numbing, and 2 hypervigilance symptoms. A PTSD symptom was coded positive when the frequency was rated 1 or more (once per week) and severity was rated 2 or more (moderate distress).

2.2.2. Treatment outcomes. Drug use, treatment interruption (missing one week of treatment services), and counseling adherence indicated participants' response to treatment in the same month, one month later, and two months after the predictor. Drug use and counseling adherence were assessed while participants were in treatment regardless of follow-up attendance; treatment interruption was coded for all 12 months. Drug use was assessed with urine test results. Urine sample collection was observed and collected on a weekly semi-random schedule (Monday, Wednesday, or Friday). Missed samples were considered "positive." Because distribution of the proportion of drug-positive urine tests was non-normal (i.e., largely flat with peaks at 0% and 100%), we used a dichotomous outcome of positive for any drug versus negative for all drugs. Of 1408 months in which urine results were available, 58% (814) were coded drug-positive. Attrition – typically defined as leaving treatment without returning – is relatively rare in methadone maintenance after the first month of treatment (Mancino et al., 2010) and was rare in this sample during this short study period, although missing treatment is considered clinically significant. We operationalized an alternative to attrition we are calling treatment interruption. Treatment interruption was defined as being absent from all treatment for at least one week during a given month. This definition also approximates the standard methadone maintenance procedure to discharge a patient who misses at least 3 days of medication. (Participants in this clinic could return to treatment after a treatment interruption, however.) Of 2028 months (169 participants with 12 follow-up months), 37% (749) were coded as having a treatment interruption. Participants were assigned to individual and group substance abuse counseling based on our evidence-based Motivated Stepped Care model (Brooner et al., 2013, 2004). Adherence to counseling was strongly negatively skewed to 100%, so we used a dichotomous outcome of 100% adherent versus <100% adherent. Of 1373 months with substance abuse counseling assigned, 48% (665) were coded 100% adherent.

2.2.3. Statistical approach. The purpose of this cohort study was to determine the impact of traumatic event re-exposure and PTSD symptoms on proximal treatment outcomes in the same month, 1 month later, and 2 months later, using data from intake and 12 monthly follow-ups. All data were analyzed using IBM SPSS statistics version 21 for Mac.

Sample characteristics were measured with means and proportions. The present study sample was compared to the sample included in the parent study (Brooner et al., 2013) but excluded for this study using *t*-tests and chi-square tests. Gender differences in participant characteristics and lifetime traumatic event exposure were also examined with *t*-tests and chi-square tests.

The main analyses examined the effect of any traumatic event exposure and PTSD symptoms on the dichotomous treatment outcomes of any drug use, treatment interruption, and 100% counseling adherence (all Y/N) using generalized estimating equations (GEE; Genlin procedure; Liang and Zeger, 1986), specifying a binomial

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