Posttraumatic stress disorder and short-term outcome in early methadone treatment

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Abstract

The aim of this study was to determine treatment adherence relative to frequency of violence and posttraumatic stress disorders (PTSD) among new methadone patients. Ninety-six opiate-abusing patients were evaluated for childhood physical and sexual abuse (CPSA), adulthood exposures to violence (ADVIOL), PTSD, and treatment adherence. Overall, 43% of the subjects dropped out of treatment within 3 months of intake. Occurrence of trauma or PTSD did not predict drop-out rates. A 2 (Gender) × 2 (PTSD) analysis of covariance (ANCOVA) with severity of other drug use on admission as a covariate, however, revealed a main effect for PTSD, \( F(4, 71) = 7.69, p < .01 \), such that those patients with current PTSD revealed significantly more ongoing drug use at 3 months (\( M = 24.3, SD = 20.9 \)) than those without (\( M = 8.9, SD = 11.8 \)). Examination of ongoing cocaine use using a 2 (Gender) × 2 (PTSD) ANCOVA also revealed a main effect for PTSD, \( F(4, 17) = 8.24, p < .005 \), such that those patients with current PTSD revealed significantly more ongoing cocaine use at 3 months postadmission (\( M = 51.6, SD = 37.6 \)) than those without (\( M = 24.3, SD = 20.9 \)). For both genders, CPSA and ADVIOL were associated with higher rates of PTSD, which in turn predicted poorer treatment adherence as measured by ongoing co-occurring drug abuse 3 months postadmission. Results underscore the need for routine assessment and targeted treatment of trauma in methadone patients. © 2000 Elsevier Science Inc. All rights reserved.

Keywords: Posttraumatic stress disorder; Dual diagnosis; Drug abuse; Treatment outcome; Child abuse

1. Introduction

The far-reaching psychological consequences of chronic traumatic victimization represents an ongoing obstacle to achieving abstinence in early recovery from drug addiction (Hien & Scheier, 1996; Janikowski & Glover, 1994). Among patients who are chemically dependent, histories of childhood trauma appear common (Brown & Wolfe, 1994; Ellason et al., 1996; Hien & Scheier, 1996; Janikowski & Glover, 1994), and confound an already complicated clinical picture (e.g., Brenner et al., 1993).

Substance-dependent inpatients with histories of childhood assault have earlier age-of-onset of substance dependence than those without such histories (Grice et al., 1995). These same individuals may be more susceptible to developing posttraumatic stress disorder (PTSD) following a traumatic event because having historically relied on substances as a way to cope with stress they have failed to develop effective coping strategies (Brown & Wolfe, 1994). Or, alternately, experiences of childhood abuse may make adults more susceptible to violent victimization, and thus to the development of PTSD (Astin et al., 1995; Brenner et al., 1993; Davies & Frawley, 1994).

Studies have indicated that for substance-dependent patients, having PTSD is associated with poorer treatment outcomes, which may include any or all of the following: (a) poor substance abuse treatment compliance manifested by ongoing severe substance abuse and high treatment drop-out rates (Brown & Wolfe, 1994; Dansky et al., 1995; Hien et al., 1995); (b) chronic psychiatric symptoms, including feelings of terror and hopelessness; intrusive recollections, hyperarousal; affective numbing; depression and anxiety; and numerous, nonspecific somatic symptoms (Brown & Wolfe, 1994; Cottler et al., 1992); and (c) high-risk sexual behaviors, which may lead to infection with human immunodeficiency virus (DeYoung, 1982; Koss & Dinero, 1989).

Untreated PTSD may be a hidden factor that hinders treatment response and adherence (Brady et al., 1994; Hien & Scheier, 1996; Ellason et al., 1996; Hien & Scheier, 1996; Janikowski & Glover, 1994; Grice et al., 1995; Dansky et al., 1995; Hien et al., 1995).
Levin, 1994). It is likely that symptoms of PTSD, including social isolation, withdrawal, sleep disturbances (Solomon et al., 1992), nightmares, and autonomic hyperarousal, make it difficult for patients to comply with aftercare. The increase in PTSD symptomatology that frequently occurs following withdrawal from substances may also exacerbate poor treatment outcomes (Brady et al., 1994; Brown & Wolfe, 1994; Kofoed et al., 1993; Root, 1989).

Despite the widespread impression that PTSD comorbidity hampers the treatment responses of individuals in substance abuse treatments (Dansky et al., 1995; Zweben et al., 1994), substance abuse programs do not regularly take into account violent trauma histories or assess for concurrent PTSD pathology. As a result, many substance abuse programs do not provide treatment for co-existing trauma-related disorders. There have been some studies that address the effects of trauma and trauma-related psychopathology on substance recovery. Among men and women seeking substance treatment, those individuals with PTSD symptoms report greater numbers of psychological hospitalizations than their non-PTSD counterparts (Brown et al., 1995). Greater use of mental health services by substance-dependent patients with PTSD may be attributed, at least in part, to deficits in coping skills, which effects their ability to successfully manage high-risk relapse situations (Brown & Wolfe, 1994). In terms of treatment efficacy, PTSD substance abusers have an earlier onset of substance relapse than non-PTSD substance abusers, although rates of relapse do not significantly differ by diagnostic status (Brown et al., 1996).

For victims of incest, PTSD symptomatology increases during the early stages of recovery, making this group particularly vulnerable to relapsing (Kovach, 1986; Young, 1990). Here as well, early relapse may be attributed, at least partially, to a flare up of PTSD symptoms in initial stages of recovery (Herman, 1992; Villagomez et al., 1995).

The present study examines the relationship between the presence of PTSD on admission to methadone treatment programs and treatment adherence at 3 months postadmission. Because gender may be a potential confound in evaluating treatment adherence, we compared women to men who were seeking methadone treatment on rates of trauma and trauma-related disorders, and examined PTSD as a predictor of ongoing polydrug use and cocaine use, as well as treatment drop-out. Based upon a growing number of studies that document high rates of trauma and PTSD in substance-abusing populations (i.e., Dansky et al. 1995; Ellason et al., 1996; Hien & Scheier, 1996), we hypothesized that subjects with PTSD would have significantly poorer treatment adherence as measured by drop-out rates as well as ongoing concurrent polydrug abuse at 3 months postadmission.

2. Materials and methods

2.1. Participants and procedures

Ninety-six (49 women, 47 men) consecutively admitted patients seeking methadone treatment for opiate-depen-

dence were asked to participate in a 2-hour interview about their history of psychological experiences, symptoms, and treatment. The mean age of the women was 33.1 years ($SD = 12.5$). Over half of the women were ethnic minorities: 23% African American, 33% Latin American, and 44% Caucasian. Most of the participants (81%) were on public assistance, while 19% reported working a part- or full-time job. Less than half (42%) of the women had attained a grade-school education, another 42% reported graduating high school, and 15.6% had attended some college. The mean age of the men was 35.8 ($SD = 14.1$). Slightly fewer than half of the men were ethnic minorities: 20% were African American, 28% were Latin American, and 52% were Caucasian. Sixty-four percent were on public assistance, while 30% reported working a part- or full-time job. Thirty percent of the men had attained a grade-school education, 53% had graduated high school or had a GED, and 17% had attended some college. There were no statistically significant differences between the genders on any demographic characteristic.

All participants were interviewed by experienced and licensed research psychiatrists or psychologists. All eligible patients participated in the study. Informed consent, which had received institutional review board approval, was obtained for all participants.

2.2. Measures

2.2.1. Psychiatric diagnosis

The Structured Clinical Interview for DSM-IV-Substance Abuse, Comorbidity Version (SCID-SAC; Spitzer et al., 1993; revised by Nunes et al., 1996) is a modified version of the SCID. It was developed to detect mood and anxiety disorders specifically among substance abusers based on their self-reported lifetime histories. As a semi-structured clinical interview, it is tailored to evaluate Axis-I differential diagnoses, including alcohol, psychoactive substance use disorders, conduct disorder, and adulthood antisocial personality. A PTSD module was included and modified to evaluate for lifetime PTSD as per criteria from the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders, (DSM-IV; American Psychiatric Association, 1994), as well as the temporal relationship between onset of PTSD and onset of regular substance use. Measures obtained included lifetime histories of PTSD as well as current (past month) presence or absence thereof. The SCID-SAC establishes a reliable procedure for detecting the temporal course of onset of substance abuse and other Axis I nonpsychotic psychiatric disorders. Field trials with the SCID-SAC (DSM-III-R version) mood and anxiety disorders have shown evidence of good inter-rater reliability and test-retest reliability (Nunes et al., 1996).

2.2.2. Lifetime trauma

Prior to the SCID-SAC, the Traumatic Events Questionnaire (Fullilove et al., 1993; modified by Hien & Scheier, 1996) was given. This is a structured assessment of exposures to specific traumatic life events, which was modeled after Fullilove et al.’s (1993) work assessing trauma histories.
of substance-abusing women. We inquired about a variety of lifetime traumatic events, including frequency of homelessness, adulthood interpersonal violence, child and adult loss, sexual abuse, rape, bartering sex, serious physical accidents, witness to murder, and mutilation. If an event was reported to have occurred, subjects were asked to rate its severity (mild-moderate-severe) and to indicate whether the event had occurred within the past 6 months. Age-of-onset and number of traumatic events were also ascertained. Composite dichotomous scores were generated for childhood physical abuse, childhood sexual abuse, childhood physical or sexual abuse, and adulthood interpersonal violence.

2.2.3. History of drug use
The Drug Use Questionnaire (DUQ; Hien & First, 1991) is a 61-item drug history interview designed to provide comprehensive information concerning the use of the following drug classes corresponding to the third edition, revised, of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III-R; American Psychiatric Association, 1987): alcohol, cannabis, stimulants, opioids, cocaine, hallucinogens/PCP, and other drugs. For each drug class, questions are asked to ascertain patterns of drug use including age of onset, frequency, and duration of use.

2.2.4. Outcome measures of treatment adherence
The following clinical measures were used to ascertain dimensions of treatment adherence. These measures were based upon clinically routine methods for determining early treatment progress. Included were (a) drop-out rates (retention), (b) global assessment of early outcome (progress: good or poor), and (c) for a subsample of 80 cases, percentage of positive of urine toxicology screens for drugs or alcohol (compliance).

1. Drop-out rates (active vs. inactive)—retention Status of continued treatment attendance at 3 months postadmission was ascertained through chart review. Subjects were coded for their treatment attendance as Active or Inactive (Drop-out).

2. Global outcome—progress In addition, codes were generated for the reasons subjects failed to complete 3 months of treatment. These reasons included successful detoxification treatment (n = 18), being transferred to a new site (n = 2), dropping out of treatment due to non-compliance with rules of program (n = 10), and failing to attend on a regular, consistent basis (n = 39). In five cases, the reason for inactive status was not clearly documented and could not be coded. These five subjects were dropped from both the analysis of drop-out rates and of global outcome. Final global outcome codes were given as follows: outcome was coded as “good” either if an individual subject remained on “active” treatment status (n = 32), or if they were “inactive” but had successfully completed a detoxification, or had been transferred to another treatment program (n = 20). A final outcome code of “poor” was given if the individual was “inactive” and the reason was coded as noncompliance or failure to attend regularly (n = 49).

3. Positive urine toxicology screens—compliance A review of charts for documentation of weekly urine screens was conducted. Of the 96 cases, 80 charts were complete with toxicology reports for time in treatment. Therefore, the analyses using urine screen data were conducted on a subset of cases (80/96; 83%). The reasons for missing information appeared to be some unreliability on the part of the methadone program staff in taking the urine screens and in filing the results. Because of a concern about an attrition bias, a statistical analysis comparing the attrition cases (n = 16) with the remaining 80 subjects revealed no statistically significant differences on any demographic, treatment, or diagnostic characteristics (especially rates of current PTSD, or ongoing drug or alcohol use). Thus, it appeared that the 83% subset sample maintained representation of the entire original sample.

Weekly urine drug screens were obtained from all subjects as part of standard clinic practices. Toxicology screens over a period of 3 months following admission were analyzed for the presence of alcohol, cocaine, opioids, marijuana, and sedatives. For each class of substances tested, a percentage score denoting positive drug use was determined by dividing the number of urine drug screens with positive results by the total number that were taken over a 12-week period. Individual substance use indices were thus derived for alcohol, cocaine, opioids, marijuana, and sedatives. An overall multiple substance use index was created by taking a mean score of the total of individual substance indices. For those cases where the complete 12-week urine screen was not available due to inactive treatment status (n = 49), the percentage for each class of substance tested was prorated for the total number of urine screens taken prior to discharge.

3. Results
A univariate approach was used to conduct all descriptive statistics in order to characterize the data set and to determine intercorrelations among variables. Correlations, t-tests and chi-square tests were conducted in order to determine which potential covariates were most salient and should have been included in the analyses of covariance (ANCOVAs). Whenever possible, ANCOVA procedures were conducted to control for relevant variables that were not the focus of the research hypotheses.

3.1. Trauma characteristics of sample
Table 1 depicts the gender comparison of rates of child and adulthood victimization for subjects in the study. Over two thirds of the women and nearly the same number of men reported exposure to at least one severely violent adulthood event. Over half of the sample also were exposed to at least one nonviolent traumatic event in adulthood. There was a sta-
Table 1
Rates of trauma, current posttraumatic stress disorder (PTSD), and multiple substance use by gender in 96 consecutively admitted methadone maintenance patients

<table>
<thead>
<tr>
<th>Type of trauma or diagnosis</th>
<th>Total sample (N = 96)</th>
<th>Male (n = 47)</th>
<th>Female (n = 49)</th>
<th>χ² (df = 1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Child physical</td>
<td>22.9 (22)</td>
<td>19.1 (9)</td>
<td>27.1 (13)</td>
<td>NS</td>
</tr>
<tr>
<td>Child sexual</td>
<td>16.7 (16)</td>
<td>4.3 (2)</td>
<td>29.2 (14)</td>
<td>10.52*</td>
</tr>
<tr>
<td>Adult violence</td>
<td>59.4 (57)</td>
<td>56.5 (27)</td>
<td>61.2 (30)</td>
<td>NS</td>
</tr>
<tr>
<td>Domestic violence</td>
<td>26.0 (25)</td>
<td>11.1 (5)</td>
<td>40.8 (20)</td>
<td>10.60*</td>
</tr>
<tr>
<td>Adult nonviol</td>
<td>56.3 (54)</td>
<td>54.3 (26)</td>
<td>53.1 (26)</td>
<td>NS</td>
</tr>
<tr>
<td>PTSD</td>
<td>19.8 (19)</td>
<td>12.8 (6)</td>
<td>25.5 (13)</td>
<td>NS</td>
</tr>
<tr>
<td>Multiple drug use</td>
<td>35.4 (34)</td>
<td>29.5 (14)</td>
<td>40.0 (20)</td>
<td>NS</td>
</tr>
</tbody>
</table>

Note. Child Physical = Childhood Physical Abuse; Child Sexual = Childhood Sexual Abuse; Adult Violence = Exposure to any adulthood interpersonal violence as a witness or victim; Domestic Violence = Involvement in any partner violence as a victim; Adult Nonviol = Exposure to any adulthood nonviolent trauma; NS = not significant.

* p < .05.

A statistically significant difference in the reports of involvements as victims of domestic violence, χ²(1) = 10.60, p ≤ .001, with 40% of the women reporting a positive history of partner violence in comparison to only 11% of men. Nearly 30% of the women reported a history of childhood sexual abuse. This rate was statistically significantly different from the men, χ²(1) = 10.52, p ≤ .001, where only 2% reported a positive history of child sexual abuse. There were no differences between the men and women in rates of childhood physical abuse where approximately 25% (1/4–1/5) of the sample reported a positive history of physical abuse. Additionally, for 58 cases (60% of the total sample) of those with a trauma history (i.e., any violent event experienced), the first traumatic event occurred prior to the onset of the substance use disorder. In only 20% of the cases (n = 20) did a first traumatic event occur after the onset of drug or alcohol dependence. In 18 cases (n = 58) there was not enough information available to make a valid determination of the temporal relationship between age of onset of trauma and age of onset of a substance use disorder.

Table 1 also depicts the rates of current PTSD, and multiple substance use for this sample of treatment-seeking methadone patients. Although not statistically significant, over 25% of the women sampled met DSM-IV criteria for PTSD, substantially more than the 12% of men who met PTSD criteria. A large proportion (40% of women and 29% of men) also presented for treatment with multiple drug dependencies.

3.2. Dimensions of treatment adherence

3.2.1. Drop-out rates (retention) and global clinical outcome (progress)

Overall, 51% (49/91) of the subjects dropped out of treatment before the first 3 months. There were no statistically significant differences in drop-out rates for men and women in this sample, nor for those individuals with current PTSD versus no-PTSD. Univariate and multivariate analyses also failed to reveal any significant relationship between the presence of current PTSD and global clinical outcome at 3 months post-baseline assessment.

3.2.2. Positive urine toxicology screens (compliance)

Because the outcome variable for ongoing alcohol and/or drug use was positively skewed (skewness coefficient: 1.5), a logarithmic transformation was performed that successfully normalized the data. While it was the transformed variable that was used in the analyses, means will be presented for the raw score to allow for more meaningful interpretation of the scores. Treatment adherence as measured by the percent or proportion of urines positive for alcohol, cocaine, opioids, marijuana, or sedatives is displayed in Table 2, which depicts the rates of multiple substance use during the first 3 months of methadone treatment by trauma and PTSD status. Bivariate analyses revealed that current PTSD separately predicted higher overall rates of multiple substance use 3 months postadmission. However, there was no statistically significant relationship between PTSD and rates of alcohol, opioids, marijuana, or sedative use individually. When examining each substance of abuse separately for its relationship to PTSD, it appeared that cocaine use was contributing most to the variance on the multiple substance use outcome index. Therefore, analyses were conducted two ways: (1) using an overall index for rates of multiple substance use and (2) using an index for rates of cocaine use.

3.2.3. Gender and PTSD as predictors of ongoing multiple substance use

A 2 × 2 ANCOVA with gender and PTSD as independent variables and baseline “other substance use” at admission as covariate on the overall multiple substance use index over a 3-month period revealed a statistically significant main effect for PTSD, F(4, 76) = 7.69, p ≤ .01. Overall, those with a current PTSD diagnosis on program admission revealed significantly worse mean treatment adherence (n = 19, M = 24.3, SD = 20.9) than those without a current PTSD diagnosis (n = 61, M = 8.89, SD = 11.8). There were no main or interaction effects for gender.

3.2.4. Gender and PTSD as predictors of ongoing cocaine use

When ongoing cocaine use was considered as an outcome measure of treatment adherence (separated out from other drugs of abuse), there were no significant gender, or Gender × PTSD interaction effects. Rather, the main effect for PTSD was statistically significant, F(4, 76) = 8.24, p ≤ .005, such that those with PTSD revealed significantly more ongoing cocaine use (n = 19, M = 51.63, SD = 37.6) than those without PTSD (n = 61, M = 20.4, SD = 31.8), regardless of gender.

4. Discussion

In line with the growing body of research on trauma in psychiatric and substance-abusing populations, our findings revealed that over two thirds of the subjects in our sample,
whether male or female, had been exposed to at least one, and in many cases, multiple and chronic, violent traumatic events, and over 50% had experienced at least one nonviolent traumatic event in adulthood. Like those with other substance use disorders (Cottler et al., 1992; Herman, 1992; Janikowski & Glover, 1994; Paone et al., 1992), individuals seeking methadone treatment also revealed high rates of traumatic life events.

Although the effects of PTSD on treatment outcome in a methadone-maintenance population have not been reported previously, our findings are also consistent with those who suggest that lifetime trauma and PTSD can impede addictions-treatment progress (Brown et al., 1996; Saladin et al., 1995). It has been suggested that substance abuse may suppress, exacerbate, or perpetuate symptoms of PTSD (Jelinek & Williams, 1984). In our study, subjects presenting with PTSD on admission revealed significantly poorer treatment adherence during the first 3 months of treatment when measured by ongoing multiple substance use (especially cocaine use).

These research findings have implications for methadone program treatment planning. Most obviously, the high rates of PTSD that we report here and the demonstrated link between PTSD and poorer treatment adherence strongly support the need for methadone treatment programs to consider PTSD as a commonly occurring disorder in this substance abuse population, and to address exposures to violence and PTSD on evaluation in treatment planning. Evaluation and assessment of trauma and trauma-related disorders should be conducted systematically, most especially with female clients and particularly in urban centers, where the base rates of community violence exposures are very high (Brown & Wolfe, 1994; Dansky et al., 1995; Hien & Levin, 1994; Hien & Scheier, 1996; Zweben et al., 1994).

Because we found that subjects with PTSD were significantly more likely to abuse multiple substances during the first 3 months of methadone treatment than those without, staff education should involve both training on early detection of PTSD, as well as education about ongoing signs of psychological distress in trauma survivors. Moreover, psychoeducational programs that can help the patients themselves to identify signs and symptoms of PTSD would be highly warranted, given the high frequency of trauma-related disorders in the population and the co-existing lack of awareness of that exposures to violence of many kinds can lead to a psychiatric condition known as PTSD. Also it has been shown that patients with substance abuse have a better treatment outcome when PTSD is assessed while still an inpatient and extensive effort is put into the follow-up treatment process (Schnitt & Nocks, 1984).

Once PTSD is diagnosed, however (see Table 3), the most effective types and modalities of treatment remains an active question. In substance abuse treatment settings, group modalities are most common (Kauffman, 1991; Nace, 1992). In this case, many issues must be addressed, such as consideration of who the group leaders would be (i.e., the level of training from paraprofessional to professional) and who the members would be, what type of group to run (i.e., psychoeducational vs. insight-oriented), and when to assign any given patient to a group. Many of these treatment complexities have been reviewed in detail by Hien and Levin (1994). In fact, although it might appear that group treatment for the trauma survivor with PTSD would be highly indicated, there are few empirical or clinical accounts that document the efficacy of this modality of treatment with methadone patients. Indeed, our own clinical work with group intervention for female substance abusers with trauma has focused our attention on a number of barriers regarding trust, isolation, and alienation in this special population that hinder rather than facilitate group cohesion (see Hien & Levin, 1994). It may also be helpful to differentiate between patients using substances to suppress symptoms of PTSD and those with lifelong substance and subsequent PTSD (Jelinek & Williams, 1984). By placing Vietnam combat veterans who were using substances to suppress symptoms of PTSD in groups where PTSD was the primary focus and substance abuse was worked with as an inhibiting factor, symptoms of PTSD were reduced and there was also a decrease in substance use (Jelinek & Williams, 1984).

We did not find an association between PTSD and treatment drop-out rates. Similar to other studies (i.e., Hien & Scheier, 1996), it appears that many other factors may be more strongly predictive of treatment readiness than diagnosis on admission. Such factors might include motivational level, reason for seeking treatment, or number of previous admissions. It is known that those with addictive disorders often must cycle through many treatment attempts before committing themselves to the recovery process (Prochaska et al., 1992). Further studies could incorporate such measures as potential mediators or control variables. However,
it is also possible that our lack of findings for drop-out and clinical global outcomes was a result of our methodology, which did not control for differences in source of referral (e.g., mandated vs. voluntary), or because some subjects were in a 3-month detoxification protocol while others were attempting a methadone-maintenance treatment.

Another potential limitation to the interpretability of study was the overlap between PTSD and depressive disorders. In our study, although not every subject with depression had PTSD, almost every subject with PTSD also had a depressive disorder. Because we did not have ratings of level of depression, we were not able to control for depression in our analyses. Indeed, this particular comorbidity issue presents a problem for empirical research on PTSD and addictions, whether epidemiological or treatment-focused. On the one hand, a failure to address the inevitable comorbidity of these disorders can only result in research efforts that have little generalizability and application to real-life clinical situations. But, confounded variables present a number of conceptual and statistical complexities. Further work with larger samples, and longitudinal designs with painstaking determination of ages at onset of all coexisting disorders, will be necessary to confirm that PTSD is the predominant psychiatric disorder associated with poor treatment compliance.

Nonetheless, our findings do provide support for the need for further development of PTSD treatments that address psychological trauma and its associated psychopathology for methadone patients. In particular, approaches are needed that specifically address the first stage of treatment for drug abusers with trauma, emphasizing phase appropriate interventions to bolster early recovery (Kaufman, 1989; Najavits et al., 1998). Brown and Wolfe (1994) and Zweben et al. (1994) raise technical questions regarding simultaneous versus sequential treatment approaches to comorbid substance abusers with PTSD. Clearly, future research must include formative evaluation research and outcome studies to validate the efficacy of newly developed group and individual approaches.

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