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Gender Differences in Trauma History and Symptoms as Predictors of Relapse to Alcohol and Drug Use

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Abstract

The objective of this study was to determine whether there are gender-specific associations between trauma exposure and alcohol or drug relapse in alcohol dependent adults. Participants were 51 men (n=24) and women (n=27) with alcohol dependence, 22 (43.1%) of whom relapsed during study participation. Severity of childhood trauma; number of lifetime events evoking fear, helplessness, or horror; and current trauma symptoms all predicted relapse in women, but not in men. These findings highlight the importance of assessing trauma history and providing treatment of trauma-related symptoms for individuals with alcohol and drug dependence, and for women in particular.

INTRODUCTION

Traumatic experiences during childhood are strongly associated with the development of substance use disorders (SUD).[1,2] With 50–90% of individuals in SUD treatment reporting experience of one or more traumatic events during their lifetime,[3–5] it should not be surprising that the prevalence of PTSD is significantly greater in this population than in the general population.[6] Among individuals in SUD treatment, co-occurring PTSD tends to be associated with greater impairment and worse treatment outcomes,[6,7] although not all studies agree on the latter point.[8,9] The evidence that trauma history predicts treatment outcomes independent of current PTSD diagnosis is even more mixed. Several studies have reported an association between relapse to substance use and childhood trauma[3,10,11] or trauma during adulthood,[8] but a number of other studies have failed to detect such a relationship.[9,12]

Gender differences in the relationship between trauma and relapse could explain some of these divergent findings. Only a few studies using heterogeneous methodologies have examined gender differences in this relationship, and, not surprisingly, the results are mixed. Although several studies have not found evidence of gender differences in the relationship

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Declaration of Interest

Dr. Anthenelli provides consultancy and advisory services to Pfizer and GlaxoSmithKline. Dr. Heffner has provided consultancy services to Pfizer. Mr. Blom has no competing interests to disclose. The Tri-State Tobacco and Alcohol Research Center has received research support from Lilly, Pfizer, and Nabi Biopharmaceuticals. The authors alone are responsible for the content and writing of this paper.

between childhood[10,11] or adult[8] trauma and post-treatment relapse to alcohol or other drugs, results of a recent study suggested that severity of childhood trauma predicted post-treatment relapse to cocaine use in women, but not in men.[13] Due to the small number of studies in this area and mixed results, further exploration of this topic is clearly warranted.

The purpose of the present study was to explore gender differences in the relationship between trauma and relapse to alcohol and other substance use by examining trauma history and symptoms as predictors of relapse in abstinent male and female alcoholics who were participating in outpatient treatment. This study builds upon the extant literature by incorporating multiple, validated assessments of childhood and lifetime trauma as well as a measure of current trauma symptoms, which has not been incorporated into prior studies of gender differences in the relationship between trauma and relapse. Based on previous findings,[13] our exploratory hypothesis was that the extent of trauma history and current trauma symptoms would predict relapse in women only.

METHODS

Participants

Participants were 51 men (*n*=24) and women (*n*=27) between the ages of 23 and 55 (*M*=40.10, *SD*=8.09) who met DSM-IV criteria for alcohol dependence and were participating in a larger laboratory study examining the effects of gender and alcoholism on stress response (ClinicalTrials.gov Identifier: NCT00226694). This study was reviewed and approved by the Institutional Review Board of the University of Cincinnati and the Cincinnati Veterans Affairs Medical Center Research and Development Committee. All participants provided written informed consent to participate.

Participants were abstinent from all substances of abuse (median length of abstinence from alcohol=111 days), excluding nicotine, and participating in residential or outpatient substance dependence treatment at the time of study enrollment. Individuals who met DSM-IV criteria for current, independent (i.e., not substance-related) mood, anxiety, or psychotic disorders were excluded from the study, as were individuals who were currently taking psychotropic medications. The majority of participants were Caucasian/non-Hispanic (60.8%), followed by African American/non-Hispanic (31.4%); African American/Hispanic (5.9%); and Caucasian/Hispanic (2.0%). Few participants (9.8%) were currently married; most were never married (37.3%) or were widowed, separated, or divorced (52.9%). Average educational attainment was high school level (mean years of education=12.39, *SD*=1.92).

Assessments

The Semi-Structured Assessment for the Genetics of Alcoholism—Version II (SSAGA-II) [14] was administered as part of the screening process to assess lifetime Axis I disorders as well as antisocial personality disorder. Severity of alcohol dependence was measured using the *Alcohol Dependence Scale* (ADS).[15] Current trauma symptoms were assessed using the *Trauma Symptom Checklist-40* (TSC-40),[16] a measure of the extent of current (i.e., past 2 months) disturbances in cognitive, emotional, behavioral, and physical functioning that are common sequelae of trauma exposure. Trauma history was assessed using the 28-item *Childhood Trauma Questionnaire-Short Form* (CTQ-SF)[17] and the 24-item *Traumatic Life Events Questionnaire* (TLEQ),[18] which are valid and reliable self-report assessments of severity of maltreatment during childhood (CTQ-SF) and lifetime exposure to potentially traumatic events (TLEQ). The CTQ-SF contains 5 subscales (Physical Abuse, Emotional Abuse, Sexual Abuse, Physical Neglect, Emotional Neglect), each scored from 5 to 25, assessing severity of maltreatment in each domain. The TLEQ assesses exposure to 22

potentially traumatic events, including an assessment of whether each event evoked feelings of fear, helplessness, or horror. For this study, we used the TLEQ count of events (out of a possible 22) that the participant endorsed experiencing and responding with fear, helplessness, or horror.

Procedures

The procedures for the larger study of stress response are described in detail elsewhere.[19] Briefly, the study included two in-person screening visits during which the diagnostic assessment and trauma assessments were completed, three laboratory test days spaced at least one week apart, and a 90-day follow-up visit. The sample for the present study was comprised of individuals who completed the laboratory test day in which the dexamethasone/corticotropin releasing hormone test was conducted as part of the larger study. Of the 51 participants, 37 (72.5%) remained in the study through the 90-day follow-up.

Use of alcohol and other substances at the time of study enrollment and at subsequent study visits was assessed through multiple means including self-report, medical records, biomarker assessment, breathalyzer testing, urine toxicology screens, and collateral informant report. At each visit, the calendar-based Timeline Followback (TLFB)[20] method was utilized to assess the frequency and amount of alcohol and drug use since the last visit. Breathalyzer testing (Alco-Sensor III®; Intoximeters, Inc., St. Louis, MO) and urine dipstick and confirmatory toxicology screens were conducted at each visit. State markers of heavy drinking such as liver function tests (gamma glutamyltransferase [GGT], aspartate aminotransferase [AST], and alanine aminotransferase [ALT]) and tests of mean corpuscular volume (MCV) were also conducted at each visit to provide an objective indication of alcohol relapse. Finally, collateral informant interviews were conducted as needed to determine relapse status in cases where participants were lost to follow-up or there was an indication that the participant may have used alcohol or other substances but the available evidence was conflicting.

Relapse was defined as any use of alcohol or illicit drugs during the study. Relapse status was determined by examining all available self-report (TLFB, reported reasons for study discontinuation), collateral informant report, medical records, and objective measures (liver enzymes, MCV, breathalyzer, and urine toxicology) of alcohol and other substance use. Participants were classified as relapsers if there was evidence of any drug or alcohol use on any one of those assessments.

Data analysis

Because of the strong correlations among the three trauma measures, the CTQ-SF total score, TLEQ count of events, and TSC-40 total scores were tested sequentially rather than simultaneously as predictors of relapse in a series of logistic regression models. Based on previous findings that childhood trauma predicted relapse to cocaine use in women but not in men,[13] we conducted these logistic regression analyses separately for men and women. Preliminary analyses of within-gender differences in the demographic and clinical characteristics of relapsers and abstainers were conducted using independent samples *t*-tests for normally distributed continuous variables, Mann-Whitney *U* tests for non-normally distributed continuous variables, and Fisher's Exact Tests for categorical variables. All logistic regression models controlled for any differences observed in preliminary analyses at the $p < .10$ level.

RESULTS

As described in detail elsewhere[19,21] preliminary comparisons of men and women in the sample suggested that they differed in terms of demographic and clinical characteristics as well as in their trauma histories. Women were significantly younger, had fewer years of education, an earlier onset of alcohol dependence, more severe alcohol dependence, and a higher prevalence of lifetime psychiatric disorders than men (all *p* values <.05). Additionally, they reported a higher number of TLEQ events evoking fear, helplessness or horror and had higher CTQ-SF Total scores as well as CTQ-SF Sexual Abuse and Emotional Neglect subscale scores (all *p* values <.05). They did not differ, however, on current trauma symptoms as measured by the TSC-40.

Twenty-two (43.1%) of the 51 participants relapsed during the period of study participation. Initial analyses within gender suggested that, excluding the trauma measures, relapsers did not differ significantly from abstainers on any of the demographic or clinical characteristics assessed, with the exception of male abstainers being marginally older than male relapsers and female relapsers having marginally fewer days of alcohol abstinence than female abstainers (see Table 1, upper panels). Thus, subsequent logistic regression analyses of trauma measures as predictors of relapse covaried for age in men and for days of alcohol abstinence in women.

Results of the three logistic regression analyses predicting relapse in men and the three parallel analyses in women are presented in Table 2. For the men, after controlling for age, none of the three trauma measures were significant predictors of relapse. For the women, however, all three of the measures were significant relapse predictors after controlling for days of alcohol abstinence. Odds ratio estimates obtained from these analyses suggested that each 1-point increase in scores on the CTQ-SF total scores and the TSC-40 total scores was associated with a 7–9% increase in the odds of relapsing. On the TLEQ, each 1-event increase in the number of traumatic events evoking fear, helplessness, or horror was associated with a 46% increase in the odds of relapsing.

Examination of mean scores for each of the three trauma measures, as depicted in the lower panel of Table 1, further demonstrates the extent to which there were gender differences in the relationship between trauma and relapse. Female relapsers scored, on average, 20 to 25 points higher on the CTQ-SF and TSC-40 and reported an average of 4 more events evoking fear, helplessness or horror during their lifetimes than women who did not relapse during the study. Inspection of each of the CTQ-SF subscales suggested that the discrepancy in severity of childhood trauma between female relapsers and abstainers was greatest in the case of emotional abuse, physical abuse, and emotional neglect. In contrast, scores on the trauma measures were not appreciably different between male abstainers and relapsers, and in some cases, the relapsers had slightly (but not significantly) lower average scores than the abstainers on these measures.

DISCUSSION

The results of the study supported our exploratory hypothesis that both trauma history and current trauma symptoms would be associated with relapse to alcohol or other substance use in alcohol dependent women, but not in men. Our findings regarding the relationship between trauma history and relapse are consistent with those of another recent study indicating that severity of childhood trauma, as indicated by scores on the CTQ-SF, predicted cocaine relapse in women, but not in men, during a 90-day period following inpatient treatment.[13] The results diverge from those of several other studies which found no gender differences in the relationship between lifetime[10,11] or adult trauma[8] and post-

treatment substance use among individuals with alcohol dependence and other substance use disorders. However, two of these studies[10,11] focused exclusively on physical and sexual abuse, and the third[8] focused on the relationship between trauma and relapse among individuals with co-occurring psychiatric disorders including mood disorders, PTSD, and psychotic disorders. Thus, differences between the present study and these prior studies with discrepant results may be attributable to differences in the populations studied and the extensiveness of the trauma assessments administered.

This study has several limitations. These are preliminary analyses employing data from a larger study that was designed to examine relapse as a secondary endpoint rather than to be primarily an investigation of relapse predictors. Thus, aspects of the study such as small sample size, variable lengths of abstinence from alcohol and other substances, and lack of information regarding the precise time point at which relapsers first used alcohol or other substances are artifacts of the parent study design. An additional limitation is the unknown validity of retrospective self-reports of trauma history, which are susceptible to recall bias as well as underreporting due to the sensitivity of the topic.[22] Also, the lower frequency or severity of some types of trauma (e.g., sexual abuse) among the men may have obscured our ability to detect statistically significant relationships with relapse in that group. Finally, although we controlled for within-gender differences in some of the clinical and demographic characteristics of the sample in our regression models, we were unable to rule out the possibility that one or more of these factors may have influenced the finding that trauma predicted relapse in women, but not in men.

In spite of these limitations, to our knowledge, this is the first study to document a gender-specific association between current trauma symptoms and relapse among individuals with alcohol dependence and without current post-traumatic stress disorder (PTSD). Moreover, it adds to a relatively small and mixed body of literature on gender differences in trauma history as a predictor of relapse by including multiple psychometrically sound assessments of the severity and extent of exposure to trauma covering multiple timeframes (i.e., childhood only and lifetime). These preliminary results suggest that, even in the absence of a current PTSD diagnosis, prior trauma and current trauma-related symptoms are both indicative of relapse risk in women with alcohol and other substance use disorders. Such findings highlight the importance of assessing trauma history and providing treatment for trauma-related symptoms for individuals with alcohol and other substance dependence, and for women in particular.

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Table 1

Within-Gender Comparisons of Relapsers and Abstainers.

	Men			Women		
	Abstinent (*n*=14)	**Relapsed (*n*=10)**	***p***	**Abstinent (*n*=15)**	**Relapsed (*n*=12)**	***p***
Demographics						
Age	47.9 (4.1)	43.9 (6.2)	.072	34.3 (6.9)	35.2 (4.9)	.706
Race (Caucasian)	9 (64.3)	7 (70.0)	.999	9 (60.0)	6 (50.0)	.707
Education (yrs)	13.1 (1.4)	13.3 (2.0)	.820	12.1 (2.0)	11.2 (1.8)	.229
Clinical Characteristics						
Age-at-onset of alcohol dependence	25.8 (5.7)	25.2 (8.0)	.835	19.9 (4.1)	21.3 (4.3)	.396
ADS score	16.5 (6.4)	17.6 (6.9)	.726	24.0 (9.7)	22.3 (9.8)	.728
Days of abstinence from alcohol (median)	103	119	.172	418	196	.093
Illicit drug abuse/dependence	11 (78.6)	7 (70.0)	.665	11 (73.3)	7 (58.3)	.448
Nicotine dependence	12 (85.7)	8 (80.0)	.999	11 (73.3)	11 (91.7)	.342
Other lifetime psychiatric disorders*	3 (21.4)	2 (20.0)	.999	9 (60.0)	8 (66.7)	.999
Trauma Measures						
TLEQ-Count of events evoking fear, helplessness, or horror	3.9 (3.1)	2.8 (3.7)	.453	5.4 (3.5)	9.6 (3.1)	.005
TSC-40 Total	30.4 (22.4)	34.7 (23.3)	.649	23.1 (16.9)	47.0 (19.1)	.002
CTQ-SF Total	53.6 (11.8)	51.4 (15.5)	.691	56.2 (17.5)	77.2 (17.4)	.008
CTQ Emotional Abuse	10.3 (5.0)	10.6 (5.5)	.885	9.6 (4.4)	16.2 (5.0)	.002
CTQ Physical Abuse	10.6 (4.9)	8.3 (3.4)	.207	7.4 (2.8)	13.7 (5.4)	.001
CTQ Sexual Abuse	5.0 (0.0)	6.7 (5.0)	.216	11.1 (7.6)	14.4 (7.9)	.291
CTQ Emotional Neglect	11.7 (3.6)	10.3 (4.9)	.424	11.9 (5.5)	17.3 (5.6)	.024
CTQ Physical Neglect	8.2 (2.9)	6.7 (2.8)	.220	8.1 (3.4)	10.4 (3.2)	.091

Note: Unless otherwise stated, values in table represent *n* (%) for categorical variables or mean (standard deviation) for continuous variables.

* Includes lifetime posttraumatic stress disorder (PTSD), social phobia, major depressive disorder (MDD), attention-deficit/hyperactivity disorder (ADHD), conduct disorder (CD), and antisocial personality disorder (ASPD).

Table 2

Results of the Logistic Regression Models to Predict Relapse Status

	β	*SE*	Wald χ^2	*OR*	95% *CI*	*p*
Men[*]						
Model 1:CTQ-SF total	−0.02	0.04	0.20	0.98	0.92–1.06	.651
Model 2: TSC-40 total	−0.01	0.02	0.03	1.00	0.96–1.04	.866
Model 3: TLEQ-count of events evoking fear helplessness, or horror	−0.29	0.22	1.82	0.75	0.49–1.14	.178
Women[†]						
Model 1:CTQ-SF total	0.08	0.03	6.16	1.09	1.02–1.16	.013
Model 2: TSC-40 total	0.06	0.03	5.23	1.07	1.01–1.13	.022
Model 3: TLEQ-count of events evoking fear helplessness, or horror	0.38	0.17	4.94	1.46	1.05–2.04	.026

Note:*SE*=standard error; *OR*=odds ratio; *CI*=confidence interval; CTQ-SF=Childhood Trauma Questionnaire, Short Form; TSC-40=Trauma Symptom Checklist-40; TLEQ=Traumatic Life Events Questionnaire.

[*]All three models included age as a covariate due to its marginally significant relationship to relapse status in men.

[†]All three models included days of alcohol abstinence as a covariate due to its marginally significant relationship to relapse status in women.