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Profiles of Youths With PTSD and Addiction

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ABSTRACT

Objective: Understanding the relationship between PTSD and addiction in adolescents may dramatically improve evidence-based practice in child psychiatry. We hypothesized that in a sample of substance addicted youth, PTSD would correlate with (1) female gender and racial minority status, (2) preference for anxiolytic substances, (3) higher burden of self injury and suicide attempts, and (4) earlier age of first use. **Methods:** One-hundred and ninety-five adolescents (52% female, ages 14–18) were court-referred to residential treatment and assessed at intake. Multi-informant data regarding Axis I diagnostic status and other clinical variables were collected via rater-administered, semi-structured interviews; medical chart review; and youth, parent, and clinician reports. Differences between subjects were evaluated using Fisher's exact test for binary variables or Kruskal-Wallis Chi-Square Test. **Results:** Substance dependent youth with comorbid PTSD were significantly more likely to be female and Latino. PTSD was correlated with preference for alcohol, narcotics, tranquilizers and inhalants. In addition, PTSD was correlated with higher burden of self-injury and suicidal behavior. Youth with PTSD were also more likely to have begun using before age 13 and reported that PTSD symptoms preceded first use. **Conclusions:** Girls and Latinos may be particularly vulnerable in developing comorbid substance dependence and PTSD. Drug preferences among youth with PTSD may reflect tendencies to target symptoms such as hypervigilance and anxiety. The recognition and early intervention among youth with trauma could prevent early first use and eventual substance dependency.

KEYWORDS

addiction; adolescent; post-traumatic stress disorder; substance use disorder

Introduction

In the United States, nearly 5% of youths ages 12 to 17 meet diagnostic criteria for illicit drug abuse or dependence (Substance Abuse and Mental Health Services Administration [SAMHSA], 2011). Youths ages 12 to 17 with substance use disorders (SUDs) exhibit increased rates of risky behaviors, poor performance in school, poor overall health, increased likelihood of continuing to abuse alcohol and other drugs (AOD) into adulthood, and early mortality (Battin-Pearson et al., 2000; Feigelman & Gorman, 2010; Thompson & Auslander, 2011). Post-Traumatic Stress Disorder (PTSD) is also common among youths and further complicates the problem of SUD. While epidemiological studies indicate that 5% of adolescents have met the criteria of PTSD in their lifetime (Merikangas et al., 2010), the rate of PTSD is as much as five times higher among adolescents in treatment for SUD, and is associated with more costly AOD treatment and a worse prognosis (Brady, Killeen, Saladin, Dansky, & Becker, 1994; Brown, Stout, & Mueller, 1999; Funk, McDermeit, Godley, & Adams, 2003).

The emerging field of adolescent addiction psychiatry has limited data regarding the clinical profile of youths with comorbid SUD and PTSD. Early research shows female gender is correlated with comorbid PTSD and SUD (Montoya, Covarrubias, Patek, & Graves, 2003). Research in adult women with SUD has shown higher rates (30% to 59%) of comorbid PTSD compared to men due to higher burden of childhood physical or sexual abuse (Blume & Zilberman, 2004). This pattern has been shown to replicate among adolescents with addiction; substance-dependent girls have higher rates of PTSD than boys with SUD due to higher rates of traumatic events, including sexual abuse and rape (Najavits, Weiss, & Shaw, 1997). Race and ethnicity may also differentiate individuals with comorbid PTSD and SUD. Latino and African-American youths have been shown to have significantly higher rates of current and lifetime PTSD (Kilpatrick & Saunders, 1997). Studies with substance-dependent youths have found higher rates of internalizing mental disorders such as PTSD and

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depression among Latino, African-American, and mixed-race youths (Chisolm, Mulatu, & Brown, 2009).

In addition, little is known about the drug use patterns and self-injurious behaviors in which youths with comorbid PTSD and SUD engage. Studies of adolescents without addiction show PTSD alone is associated with higher rates of self-injurious and suicidal behaviors compared to control groups (Lubman, Allen, Rogers, Cements, & Bonomo, 2007; Nooner et al., 2012). Moreover, active substance abuse is an independent risk factor for suicide in adolescents (Bukstein et al., 1993). However, no study to date has determined the overlay of PTSD in risk of self-injurious and suicidal behaviors among youths with addiction.

Given the complexity of studying SUDs and PTSD, no unifying theory would be sufficient to suggest an explanation for the relationship between these multifaceted issues. The most popular hypothesis currently is the self-medication theory (Khantzian & Albanese, 2008), which proposes that addiction is the resultant attempt to reduce psychological distress caused by the primary underlying psychiatric cause, such as PTSD. Other theories point to the environment of drugs and drug culture as the primary cause by predisposing individuals to exposure to trauma when in a more vulnerable state.

This study explores the demographic characteristics, drug use patterns, and behaviors that distinguish youths with comorbid PTSD and SUD in a gender-balanced sample of 195 juveniles, all diagnosed with addiction. Based on prior research, we hypothesize that PTSD will be associated with female gender, preference for anxiety-reducing substances such as alcohol and benzodiazepines, a history of physical and sexual abuse, a history of increased suicidal and self-injurious behavior, and earlier age of first use. This information can hasten recognition of comorbid PTSD and SUD, inform relapse prevention approaches of triggers associated with preferred drugs, and better tailor treatment resources for improved outcomes.

Hypothesis

Our study aims are to characterize (a) the demographic features of dually diagnosed adolescents with PTSD and SUD compared to SUD alone, (b) the impact of PTSD on drug preferences among adolescents, and (c) the risk for self-injurious behaviors associated with dual diagnosis compared to SUD alone.

We hypothesize that female gender and belonging to a minority racial/ethnic group would correlate with dual diagnosis based on prior research. We also hypothesized that PTSD would correlate with preference for anxiolytic

drugs such as alcohol and benzodiazepines based on the known pharmacologic effects of these drugs. Finally, we hypothesized that PTSD would correlate with earlier age of first use and a history of physical and sexual abuse, as well as higher rates of self-injury and suicide attempts.

Material and methods

This was a retrospective cross-sectional study of 195 youths, all who met the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition (*DSM-IV*) diagnosis of substance addiction, which today has been reclassified under Substance Use Disorder (SUD) in the *DSM-5*. Therefore, any mention in our study of substance addiction shall be referred to as a SUD.

Procedures

Recruitment for this study was conducted from February 2007 to August 2009 at a residential treatment facility in northeast Ohio for substance-dependent adolescents. All participants were ages 14 to 18 years, English speaking, had a stable address and telephone, met the *DSM-IV* diagnosis of addiction (which has been reclassified as SUD under *DSM-5*), and were medically stable. Exclusion criteria included a major chronic health problem other than substance use likely to require hospitalization, currently suicidal or homicidal, and expected incarceration in the subsequent 12 months. Eligible subjects signed statements of informed consent/assent after receiving an invitation to participate along with an information packet. Ninety-minute baseline interviews were conducted within the initial 10 days of treatment and repeated at discharge after an average of 2.2 months of residential treatment. Subjects were paid \$25 for completed assessments. All procedures of this study were approved by the University Hospitals/Case Medical Center Institutional Review Board for human investigation, and a Certificate of Confidentiality from the National Institute on Alcohol Abuse and Alcoholism was obtained. A more detailed description of study methods can be found in Kelly, Stout, Pagano, and Johnson (2011) and methods are also discussed briefly here.

The residential treatment facility provides a range of evidence-based therapeutic modalities for adolescents struggling with an SUD, including cognitive behavioral therapy, motivational enhancement therapy, reality therapy, adolescent community reinforcement approaches, gender-specific treatment, medication-assisted treatment, relapse prevention, family, individual, and group therapies, and assertive continuing care (aftercare). Typically, residents spend approximately 20 hours per week in therapeutic activities.

Table 1. Sample demographics at intake.

Demographic Characteristic	Total		PTSD	
		195 (100%)	NO 158 (81%)	YES 37 (19%)
Male	Yes	93 (48%)	85 (54%)	8 (22%)*
Age	<i>M, SD</i>	16.2 (1.1)	16.2 (1.0)	16.3 (1.2)
Racial Minority	Yes	60 (31%)	50 (32%)	10 (27%)
Latino	Yes	15 (8%)	9 (6%)	6 (16%)*
Single-Parent Household	Yes	98 (50%)	78 (49%)	20 (54%)
Parental Education	HS diploma or less	87 (45%)	72 (45%)	15 (40%)
	Some college	55 (28%)	47 (30%)	8 (22%)
	BA+	53 (27%)	39 (25%)	14 (38%)

p* < 0.05. **p* < 0.001.

Measures

Data were collected via rater-administered, semi-structured interviews, medical chart review, and youth, parent, and clinician reports. Semi-structured interviews were conducted in person by experienced clinical interviewers whose training and certification ranged from bachelor’s level to doctor of medicine. All interviewers received rigorous training and met regularly for updates and retraining on diagnostic assessments using the Mini International Neuropsychiatric Interview Plus (MINI-Plus). All individuals involved in data collection from subjects completed National Institutes of Health-required courses on human subjects’ protection. Demographic characteristics, SUDs, age of first use, psychiatric comorbidities, and clinical variables were assessed at baseline. Depending on the type of variables (continuous or discrete), the Fisher’s exact test for binary variables or Kruskal-Wallis chi-square test for continuous variables was performed to evaluate differences between subjects.

Demographic characteristics

Demographic characteristics including age, gender, race, ethnicity, single-parent household status, and parental education attainment were gathered. These results are reported in Table 1.

Axis I diagnoses

The variables relating to Axis 1 diagnoses were assessed as follows. The existence of SUD and type of SUD are reported in Table 2. These variables were measured using the rater-administered MINI International Neuropsychiatric Interview Plus. The MINI-Plus is a comprehensive diagnostic semi-structured interview that covers a wide range of diagnoses, including SUDs and PTSD. The MINI-Plus provides continuous measures such as age of first use and age of onset of SUD, as well as severity measures based on symptom counts for disorders such as PTSD and substance dependence. The MINI has

shown 85% agreement with expert psychiatric opinion and has demonstrated high concordance with alcohol and drug consumption as measured by the Alcohol, Smoking, and Substance Involvement Screening Test (ASSIST; Sheehan et al., 1998; WHO ASSIST Working Group, 2002).

Clinical variables

Five clinical variables were assessed: history of suicide attempt, deliberate self-harm, sexual abuse, physical abuse, and preteen first use. Two items from the Schedule for Nonadaptive and Adaptive Personality were used to measure youth history of attempted suicide and deliberate self-harm. The Schedule for Nonadaptive and Adaptive Personality is a self-report questionnaire composed of 375 true/false items designed to assess diagnostic, temperament, and pathological and nonpathological traits that has shown good psychometric properties with young adult populations (Klonsky, Oltmanns, & Turkheimer, 2003). The two items were (a) “I have tried to commit suicide” and (b) “I have hurt myself on purpose several times.” Participants who endorsed the first item were considered to have a history of attempted suicide. Those who endorsed the second item were considered to have a history of intentional self-harm. In the current study, physical abuse referred to any behavior that is

Table 2. PTSD and drug dependence.

Drug Dependence		Total 195 (100%)	PTSD	
			No 158 (81%)	Yes 37 (19%)
Alcohol	Yes	118 (61%)	90 (57%)	28 (76%)*
Nicotine	Yes	193 (99%)	156 (99%)	37 (100%)
Cannabis	Yes	179 (92%)	146 (92%)	33 (89%)
Stimulant	Yes	49 (25%)	37 (23%)	12 (32%)
Cocaine	Yes	50 (26%)	38 (24%)	12 (32%)
Narcotics	Yes	58 (30%)	41 (26%)	17 (46%)*
Inhalants	Yes	11 (6%)	6 (4%)	5 (14%)*
Tranquilizer	Yes	39 (20%)	25 (16%)	14 (38%)*
Hallucinogen	Yes	57 (29%)	43 (27%)	14 (38%)

p* < 0.05. *p* < 0.01.

intended to hurt an individual directly using physical force. Sexual abuse referred to the use of force or threats to compel a person to engage in any type of sexual activity against their will or without their understanding, whether the act is completed or not. Physical and sexual abuse were assessed by a trained chemical dependency counselor by asking, "Have you ever experienced sexual or physical abuse?" with standardized follow-up questions for positive responses. Preteen first use refers to age of first use of the drug of choice before age 13.

Results

Demographic characteristics

Table 1 displays the baseline demographic characteristics of our sample of 195 substance-dependent youths. We have then further divided each category in the demographic breakdown on the basis of comorbid PTSD status.

Our sample of 195 youths contained 37 individuals with PTSD and 158 without. The sample contained nearly equal proportions of male (48%) and female (52%) with an average age of 16.2 years. Female gender was significantly correlated with a dual diagnosis of addiction and PTSD. Regarding our sample's representation of racial minorities, 31% of subjects belonged to a racial minority. Our analysis showed that Latino ethnicity was significantly correlated with a dual diagnosis of addiction and PTSD.

Substance use disorders

Table 2 shows the different types of SUDs in this sample as assessed in the MINI. Again, within each category of drug preference, we distinguish individuals with comorbid PTSD versus those without. For the entire sample, the most common type of SUD was nicotine dependency (99%). and then marijuana dependency (92%) followed by alcohol dependency (61%). PTSD was significantly correlated with addiction to alcohol, tranquilizers, inhalants, and narcotics. For the other substances, no significant difference was found between the proportion of addicted youths based on their PTSD status.

Clinical variables

Table 3 documents the prevalence of suicide attempts, self-injury, physical abuse, sexual abuse, and preteen first use among substance-addicted youths with and without comorbid PTSD. PTSD was significantly correlated with all of these variables.

Table 3. PTSD and clinical variables.

Clinical Variable		Total 195 (100%)	PTSD	
			No 158 (81%)	Yes 37 (19%)
Suicidal Attempt(s)	Yes	47 (24%)	33 (21%)	14 (38%)*
Self-Injury	Yes	69 (35%)	50 (32%)	19 (51%)*
Physical Abuse	Yes	45 (23%)	29 (18%)	16 (43%)**
Sexual Abuse	Yes	50 (26%)	31 (20%)	19 (51%)**
Preteen First Use	Yes	67 (34%)	46 (29%)	21 (57%)**

* $p < 0.05$. ** $p < 0.01$. *** $p < 0.001$.

Onset ordering

Figure 1 shows that among substance-dependent youths with PTSD symptoms, 59% had PTSD symptoms precede their first use, 11% had simultaneous onset, and the remainder had PTSD symptoms following their first use.

Discussion

This was a retrospective cross-sectional study, which compared the characteristics of 195 substance-addicted youths, based on comorbid PTSD status. We found that among substance-addicted youths, comorbid PTSD was associated with the following:

- female gender,
- Latino ethnicity,
- preference for alcohol, tranquilizers, inhalants, and narcotics,
- history of physical abuse, sexual abuse, self-harm, suicide attempts, and
- preteen first use.

These findings offer valuable insights into a minimally studied area. Understanding the profile of dually diagnosed youths can assist with developing more tailored approaches to prevention, recognition, and treatment.

Our finding that dual diagnosis is associated with female gender is congruent with preliminary data, which have shown higher rates of PTSD among substance-addicted girls compared to boys. The same previous research concluded that this difference results from higher rates of sexual trauma and rape among female youths, leading to substance use and eventually addiction, which may be in order to self-medicate anxiety and negative affect (Blume & Zilberman, 2004). Another explanation may be that if young females are using drugs when they experience a trauma, they are more likely than their male counterparts to develop PTSD. Future research on substance-addicted youths is needed to discern whether resiliency characteristics of the individual or environmental factors determine the concomitant development of PTSD.

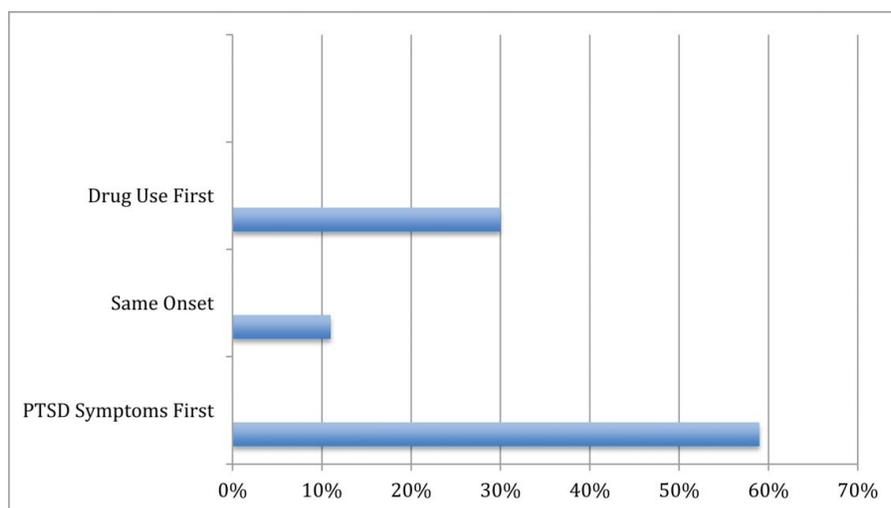


Figure 1. PTSD symptoms versus first use.

The association between Latino ethnicity and dual diagnosis is a particularly interesting finding and adds to the nascent body of research demonstrating that Latinos are at higher risk for PTSD than any other racial or ethnic group in the United States (Pole, Best, Metzler, & Marmar, 2005). There was a significantly higher proportion of Latinos in our sample with PTSD (16%) compared to the proportion of Latinos in the sample without PTSD (6%). Suggested explanations for the higher representation of Latinos with dual diagnosis include greater environmental exposure to trauma, increased peritrauma dissociation, and culturally informed maladaptive coping mechanisms such as *fatalismo*. (*Fatalismo* is a philosophical doctrine holding that all events are predetermined in advance for all time and human beings are powerless to change them.) Although the underlying reason remains to be further explored, our data support the data concerning the particular burden of PTSD among Latinos and warrant further study to understand this pattern.

Our data show that having a diagnosis of PTSD is associated with addiction to alcohol, tranquilizers, inhalants, and narcotics. It is interesting to note that among the drug classes in our study, the only three that uniquely share similar effects including decreased anxiety, awareness, and sensitivity to pain, correlated with a diagnosis of PTSD. This suggests that teens with PTSD are preferentially using alcohol, tranquilizers, and narcotics to self-medicate symptoms of PTSD such as hyperarousal, anxiety, and pain resultant from traumatic experiences. The association between PTSD and addiction to inhalants is more difficult to classify, as this is a broad category of substances with effects that can range from excited to depressed states and can include hallucinatory states as well. Understanding which substances youths use is

essential to tailoring recovery programs, as the reasons for use and triggers to relapse differ greatly.

PTSD was significantly associated with a history of suicide attempt and a history of self-injurious behavior, which agrees with the current conception that both addiction and PTSD independently indicate increased risk for self-harm. The final clinical variable assessed was preteen use, which was also found to be associated with PTSD. In the majority of cases, adolescents with PTSD reported that their PTSD symptoms preceded first use or occurred concomitantly. These results imply that early first use would not be an appropriate point of detection and intervention in these cases, as it appears only after a significant amount of trauma has already been done. Rather, early detection of trauma or signs of PTSD could prevent preteen first use, as well as the devastating consequences on physical and mental health.

This study is the largest gender-balanced study of substance-addicted youths to date and demonstrates several important trends within this population relating to comorbid psychiatric problems. Although there have been many studies of substance use in youths, there is a dearth of work looking at the problem of early use in preteens and psychiatric comorbidities. In addition, very few studies have examined the problem of addiction in youths and have instead documented use of alcohol and illicit drugs. Because this is a clinical treatment-seeking population rather than a nonclinical community sample, we are able to draw stronger conclusions about the relationships between SUDs and psychiatric concerns due to the more concentrated pathology in our sample. In addition, our study uniquely provides the breakdown of which substances youths were addicted to, whereas the majority of other studies do not make this categorical distinction.

Limitations

Our study was a retrospective cross-sectional design, examining clinical differences among a sample of addiction treatment-seeking adolescents with a median age of 16.2. Because we surveyed these youths several years after the onset of their PTSD symptoms and first use, it is possible our data was affected by recall bias. Youths with a history of trauma and substance dependence may indeed have difficulty remembering the order of events, which occurred several years prior to seeking treatment. Youths with a history of trauma may also be more likely to recall the traumatic event with increased perception of causality. Moreover, youths with a history of trauma preceding first use may be more likely to present for treatment due to greater impairment in psychosocial functioning and consequently be overrepresented in our sample.

Conclusions

Although complex, understanding the relationship between PTSD and addiction in youths is essential to improving adolescent mental health. It appears that in substance-addicted youth populations, PTSD is associated with female gender and Latino ethnicity. Previous work has attributed these trends to environmental factors such as increased rates of sexual trauma for girls and individual factors such as culturally influenced coping mechanisms for Latinos. The drug preferences among substance-addicted youths with PTSD reflect a self-medication pattern and perhaps socioeconomic influences as well. Recognizing the profile of dual-diagnosis youths may lead to earlier intervention and understanding the type of substance used will help tailor treatments for more successful recovery. According to our findings, PTSD signifies a higher overall psychological burden within an already distressed population, including earlier use of drugs and higher rates of attempted suicide and self-injury. These observations have important implications for researchers and clinicians working to better understand the individuals they care for and develop programs for prevention and recovery.

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