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Alcohol Use Disorder and PTSD: An Introduction

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Introduction

Alcohol use disorder (AUD) and posttraumatic stress disorder (PTSD) are two of the most common, chronic and debilitating mental health disorders in our society. Epidemiologic data indicate that lifetime rates of AUD and PTSD in the general population are 29.1% and 7.8%, respectively (Grant et al., 2015; Kessler et al., 1995). These two disorders frequently co-occur and are associated with substantial suffering and functional impairment. This paper introduces a virtual issue of Alcoholism: Clinical and Experimental Research (ACER) which is focused on the co-occurrence of AUD and PTSD. This introduction is not a comprehensive review of the topic, but rather a focused review of recent papers published in ACER that address treatments for comorbid AUD and PTSD, and discuss special populations at increased risk of developing AUD and PTSD.

To begin, two systematic reviews discuss the current state of behavioral (Simpson et al., 2017) and pharmacological (Petrakis & Simpson, 2017) treatments for comorbid AUD/PTSD. The Simpson et al. (2017) article extends prior reviews of behavioral treatments for AUD/PTSD by considering whether comparison treatment conditions are matched to the experimental treatment condition on time and attention, and by reporting on alcohol and drug use outcomes separately when possible. The Petrakis and Simpson (2017) review of pharmacological treatments is specific to the comorbidity of PTSD and AUD, as compared to other substance use disorders, and it includes several more recently published randomized controlled trials that are not included in prior reviews on this topic.

In the next section, two studies focus on the prevalence and correlates of AUD and PTSD in racial and ethnic minority communities. Werner and colleagues (2016) report on the increased rates of trauma exposure and PTSD among African American (AA) women as compared to European American (EA) women, and examine differences in the relationship between PTSD and AUD among AA and EA women. This study extends prior work by examining the unique contributions of specific types of trauma and PTSD on alcohol

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involvement in AA and EA women, and identifying racial/ethnic disparities in the prevalence and timing of first alcohol use, AUD symptoms and AUD diagnostic progression. The Emerson et al. (2017) study is the first to examine the association between AUD and PTSD in American Indian and Alaskan Natives (AIAN) as compared to non-Hispanic Whites. High rates of PTSD among AIAN women and high rates of comorbid AUD/PTSD among AIAN men, in particular, are highlighted and discussed in terms of the need for targeted screening and intervention among AIAN communities.

Finally, two studies in this virtual issue focus on military personnel and veterans. The first study by Stein and colleagues (2017) reports on alcohol misuse and AUD prior to enlistment in the Army, and highlights the strong association between prior AUD and subsequent development of PTSD among newly enlisted soldiers. The second study is a laboratory study (Ralevski et al., 2016) among military veterans with AUD and PTSD. It is among the first studies to examine the effects of trauma cues and stress (non-trauma) cues on alcohol craving, mood, physiological and neuroendocrine responses, and demonstrates the powerful effects of trauma cues on alcohol craving and consumption. Together, the six papers included in this virtual issue raise important considerations for future research and may help to inform best practices in the treatment of comorbid AUD and PTSD.

Treatments for Comorbid AUD and PTSD

Two papers in this virtual issue focus on the behavioral and pharmacological treatment of comorbid substance use disorders (SUD) and PTSD. In their critical review of behavioral treatments, Simpson and colleagues (2017) identified 24 randomized clinical trials (RCTs) which involved 2,294 individuals with comorbid SUD/PTSD. The RCTs were comprised of: 1) exposure-based interventions, 2) coping-based interventions, and 3) addiction-focused interventions. Comparison of these three intervention types demonstrated that exposure-based treatments were the most effective in reducing PTSD symptoms. In addition, exposure-based treatments produced SUD outcomes that were comparable, or sometimes superior to, SUD outcomes yielded by the control group. This is of significant importance given that there has historically been some concern that exposure-based treatment would result in increased substance use. This concern, which is unsupported by data, dissuaded some providers in the past from applying effective exposure-based treatments with their SUD/PTSD patients. Based on their review, Simpson and colleagues recommend using behavioral interventions that integrate exposure-based PTSD treatment with behavioral treatment for AUD. The authors also point out that participation in most of the treatment conditions investigated in the RCTs resulted in some reduction in SUD and PTSD symptoms. Furthermore, the review indicated that even when one treatment was superior to the comparison condition, the benefits tended to be modest, indicating that there is significant room for improvement in behavioral interventions targeting SUD/PTSD.

While many of the RCTs in the Simpson et al. review utilized control groups that were addiction-focused treatments, none used a PTSD-only control condition. This is likely due to medical, safety and ethical issues associated with not addressing an active substance use disorder. Most of the addiction-focused studies included in the review were secondary analyses conducted as part of larger SUD clinical trials in which SUD outcomes were

investigated among a subsample of participants who also had comorbid PTSD. Unfortunately, only one of the addiction-focused studies assessed PTSD symptoms. Battersby and colleagues (2013) used the PTSD Checklist (PCL) assessment tool before and after a 9-month SUD intervention as compared to treatment as usual. The PCL is a self-report instrument that uses a 5-point Likert scale to rate 17 different PTSD symptoms. The PCL has a range of 17–85 and higher scores indicate more severe PTSD symptoms. Significant improvement was reported in PTSD severity in both the treatment and treatment as usual conditions, however the PCL only reduced by 4.5 points (53.41 to 48.95) in the treatment group and 5.6 points (52.57 to 47.00) in the treatment as usual group. Although the differences may have reached statistical significance, these reductions do not represent the clinically meaningful change levels of at least 10 to 20 points on the PCL (Monson et al. (2008). In future research, examination of clinically meaningful and significant change as well as diagnostic remission rates in both PTSD and SUD is recommended.

Study retention is a significant challenge with this patient population. Avoidance is a hallmark symptom of PTSD and is a coping style commonly associated with AUD. Approximately 50% of participants in the RCTs completed treatment, with no significant differences in completion rates between the three treatment modalities. However, the definition of a treatment “completer” varied widely across the studies. In some studies, participants who completed only 25% of the total number of sessions were considered completers, while in other studies only participants who completed 100% of the total number of sessions were considered completers. Irrespective of the definition employed, there is considerable room for improvement in this area, as noted by Simpson and colleagues, and a need to establish best practices for patient engagement and retention.

The pharmacological treatment of comorbid AUD/PTSD is an emerging area of investigation. The study by Petrakis and Simpson (2017) critically reviewed nine investigations that were grouped into three categories: 1) medications intended to target AUD (but which may also have effects on PTSD outcomes), 2) medications intended to target PTSD (but which may also have effects on AUD outcomes), and 3) medications intended to target both AUD and PTSD by means of addressing shared neuropathologies. The studies that examined medications targeting AUD (e.g., naltrexone, disulfiram) generally found that these medications produced more favorable AUD outcomes, and that this is true among participants with or without comorbid PTSD. One study investigated a medication for AUD (naltrexone or placebo) in combination with a behavioral treatment (prolonged exposure or supportive counseling) (Foa et al., 2013). As expected, naltrexone resulted in significantly reduced alcohol craving and percent days drinking; at the 6-month follow up, patients who received the combination of naltrexone and prolonged exposure were more likely to have clinically significant improvement in PTSD symptoms. Batki and colleagues (2014) evaluated topiramate in veterans with AUD and PTSD and observed more favorable AUD outcomes in the topiramate group, and a trend toward lower PTSD symptoms in the topiramate group.

The studies that examined medications targeting PTSD all tested selective serotonin reuptake inhibitors (SSRIs) and none observed a between-group difference in AUD or PTSD outcomes, although trends in PTSD improvement were observed in participants treated with

sertraline. Finally, several studies investigated medications that were hypothesized to treat both AUD and PTSD (e.g., prazosin and aprepitant), with no clear benefit on AUD or PTSD outcomes. A number of factors may have influenced the findings noted in this review, including gender differences, veteran vs. civilian status, and the various behavioral platform employed. In summary, Petrakis and colleagues conclude that clinicians can be reassured that medications that are approved to treat AUD can be used safely and with some efficacy in patients with PTSD, and vice versa. Addressing both disorders, either by pharmacological interventions, behavioral interventions or their combination, is encouraged and likely to yield the most effective outcomes for patients with comorbid AUD/PTSD. For additional review of the two papers addressing behavioral and pharmacological treatments for comorbid SUD and PTSD, refer to Norman and Hamblen (2017).

Race and Ethnicity Considerations Related to AUD and PTSD

Two studies featured in this virtual issue analyzed extensive cross-sectional data to discern the complex effects of race and ethnicity on AUD and PTSD. Werner and colleagues (2016) utilized a large dataset of almost 4,000 women to examine comparative differences in alcohol use patterns, AUD prevalence, and the relationship between trauma and AUD among European American (EA) and African American (AA) women. EA women were found to be more likely than their AA counterparts to use alcohol and to develop AUD. In contrast, AA women were more likely than their EA counterparts to experience trauma and to develop PTSD. There were connections between exposure to specific traumas (most commonly sexual and physical abuse) and increased risk of early alcohol initiation and subsequent development of AUD, although these connections were only observed among EA women. Further research is needed to better understand the findings and to identify factors that are related to the development of AUD in AA women. The authors emphasized that even though AUD was found to be less common in AA women as compared to EA women, AUD is still prevalent and problematic among AA women. Furthermore, research shows that AA individuals experience more severe symptoms of AUD as compared to EA individuals (Mulia et al., 2009). Future investigations of AUD/PTSD are encouraged to examine racial/ethnic disparities in presenting characteristics and treatment outcomes in order to better inform our understanding of the influence of race and ethnicity on AUD/PTSD and assist in the development of more effective interventions.

In the paper by Emerson and colleagues (2017), the authors examined the association between AUD and PTSD in American Indians/Alaskan Natives (AIAN) as compared to non-Hispanic Whites (NHW). In a large sample of over 19,000 participants, prevalence rates of AUD, PTSD, as well as comorbid AUD/PTSD were found to be significantly higher in AIAN participants as compared to NHW participants. The highest prevalence rates of lifetime PTSD were observed in AIAN women, and the highest rates of comorbid AUD/PTSD were observed in AIAN men. Both the Werner and Emerson papers suggest the need to develop more tailored and comprehensive assessment methods, and develop more effective interventions to help reduce the heavy burden of trauma, PTSD and AUD in racial and ethnic minority communities.

Military Personnel and Veterans

Two articles in this virtual issue focus on military personnel and veterans. The first study by Stein and colleagues (2017) utilized a large sample of over 30,000 newly enlisted U.S. Army soldiers to examine the prevalence of alcohol misuse and AUD prior to entering the military, as well as associations with comorbid PTSD and other mental health conditions. High rates of binge drinking, heavy drinking, and AUD were observed, particularly among White, male soldiers. A bidirectional relationship between alcohol misuse and PTSD was observed. That is, prior AUD was strongly associated with the onset of subsequent PTSD (AOR = 3.15), more so than any other mental health condition assessed (e.g., major depressive disorder, generalized anxiety disorder, panic disorder, mania/hypomania, suicidal ideation). Prior PTSD was also associated with the subsequent development of AUD (AOR = 2.31). The particularly strong association between prior AUD and subsequent PTSD suggests that assessment of AUD and alcohol misuse may help identify soldiers at increased risk for PTSD after exposure to traumatic events. As noted by the authors, conjoint assessment and recognition of alcohol misuse and PTSD upon entry into the military represents an enormous opportunity for intervention and risk mitigation early in the service member's career.

Finally, Ralevski and colleagues (2016) conducted a human laboratory study among a small sample of military veterans with AUD and PTSD who were enrolled in a clinical trial. The laboratory study examined responses to audio-recorded trauma scripts as well as stress scripts. The scripts consisted of brief (approximately several minutes long) idiographic, imagery cues that portrayed in detail the specific experiences of that particular individual in that situation (e.g., the specific physical and bodily sensations, interpersonal context, emotions, and visual stimuli observed) (Sinha & Tuit, 2012). The findings revealed that exposure to the trauma cues produced the most significant increase in alcohol craving. Furthermore, trauma-induced craving, but not stress-induced craving, was positively correlated with alcohol consumption. That is, higher levels of craving following the trauma script were strongly associated with an increased frequency of heavy drinking days. These findings demonstrate the functional relationship between PTSD and AUD, and highlight the need for interventions to specifically target the trauma cues and PTSD symptoms as they relate to craving and alcohol use behaviors. Adequately treating PTSD in patients with comorbid AUD may help reduce craving and risk of relapse.

Summary and Future Directions

Taken together, the papers included in this virtual issue on AUD and PTSD raise important issues regarding best practices for the assessment and treatment of comorbid AUD/PTSD, and highlight areas in need of additional research. First, all patients presenting with AUD should be assessed for trauma exposure and PTSD diagnosis. Data from the Ralevski et al., (2016) paper demonstrate the powerful effects that trauma reminders have on craving and alcohol consumption and, therefore, treatment needs to address both the AUD and PTSD symptoms. With regard to behavioral treatments, exposure-based interventions are recommended given the greater improvement in PTSD symptoms observed, coupled with significant reductions in SUD severity experienced. The available evidence suggests that medications used to treat one disorder (AUD or PTSD) can be safely used and with possible

efficacy in patients with the other disorder. However, additional research on pharmacological agents based on shared neurobiology of AUD and PTSD would be useful.

In addition, research is needed to identify ways to enhance the magnitude of improvement offered by behavioral and pharmacological interventions for AUD/PTSD, which is modest at this point. Next steps might include research to identify patient characteristics that are associated with greater improvement in one type of treatment or another in order to facilitate treatment matching. Several candidate variables include symptom severity of AUD and PTSD, temporal order of onset of the two disorders, gender, military status, and patient preferences for treatment (Simpson et al., 2017). Patient goals for treatment (e.g., abstinence or reduced use) and changes in goals during the course of treatment may also be useful to consider (Lozano et al., 2015). Research on synergistic combinations of behavioral and pharmacological interventions to concurrently reduce AUD and PTSD severity is another area in need of greater attention. Finally, a better understanding of how changes in alcohol use influence changes in PTSD severity during treatment, and vice versa, may help inform treatment development and implementation; this might include evaluation of changes in, for example, cognitive functioning, sleep, neuroendocrine and physiological arousal, and cravings to use substances.

Given the high rates of dropout reported across studies and treatment types, research is needed to enhance retention among individuals with AUD/PTSD. Relatedly, the definition of a treatment “completer” needs to be better standardized, as it is difficult to interpret and compare treatment outcomes across studies when the results are based on patients who received widely different amounts of the prescribed treatment. It is recommended that all trials report on participants who complete the entire treatment protocol. Investigators may also want to report on a subgroup of participants who completed the minimum therapeutic dose deemed adequate for that particular treatment, but the minimum dose needs to be based on a strong theoretical rationale, supported by empirical data, and defined a priori.

Greater attention to members of our society who disproportionately bear the burden of trauma exposure, PTSD and comorbid AUD is warranted. As discussed in the papers presented in this virtual issue, this includes members of racial and ethnic communities as well as military service members and veterans. Going forward, it is recommended that all trials actively work to include adequate numbers of racial/ethnic minority individuals in order to report on disparities in presenting clinical characteristics (e.g., trauma history including information about specific types of trauma exposure, severity of PTSD and AUD symptoms, history of AUD including age of initiation and onset of diagnosis, comorbid mental health disorders) and treatment outcomes. Data from the Werner et al., (2017) paper suggest that the existing etiological models of AUD development, as well as risk and protective factors, may be different based on racial/ethnic background. A better understanding of AUD etiology among racial/ethnic minority individuals is an important and necessary next step in the development of effective interventions.

Finally, AUD and PTSD are two of the most common mental health disorders afflicting military service members and veterans. As such, continued research on the development of effective screening, prevention and treatment interventions for service members and veterans

is critically needed. Based on the work of Stein and colleagues (2017), pre-enlistment screening to identify service member with alcohol misuse or AUD will also likely help identify those at risk of developing PTSD, or other mental health problems (e.g., depression, panic disorder), during military service. Given that most service members have post-enlistment onset of AUD, effective ways to monitor alcohol use during service are needed in order to identify and address alcohol related problems early on and thereby minimize risk of the development of PTSD and other psychiatric comorbidities. Although a strong association between pre-enlistment AUD and post-enlistment PTSD was observed in the Stein et al. study, the reasons underlying this association are unclear and additional research to elucidate the ways in which prior AUD increases risk for PTSD would help inform etiological and treatment models.

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