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Civilian Stressors Associated with Alcohol Use Disorders in the National Guard

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Abstract

Background—Alcohol use disorders are a serious public health concern among soldiers. Although deployment-related exposures have been linked with alcohol use disorders in soldiers, less is understood about the link between modifiable, civilian stressors and post-deployment alcohol use disorders.

Purpose—To (1) compare the influence of civilian stressors and deployment-related traumatic events and stressors on post-deployment alcohol use disorders among Army National Guardsmen primarily deployed to Afghanistan and Iraq; and (2) evaluate whether civilian stressors influence a different set of alcohol use disorder phenotypes than deployment-related traumatic events and stressors.

Methods—A cohort of Ohio National Guard soldiers was recruited in 2008–2009 and interviewed three times over 3 years. The analytic sample included Ohio National Guard soldiers who had been deployed by 2008–2009, had participated in at least one follow-up wave, had reported consuming at least one alcoholic drink in their lifetime, and had non-missing data on alcohol use disorders (n=1,095). Analyses were conducted in 2013.

Results—In a model including measures of civilian stressors and deployment-related traumatic events, only civilian stressors (OR=2.07, 95% CI=1.46, 2.94) were associated with subsequent alcohol use disorder. The effects of civilian stressors were only present among people with no history of alcohol use disorder.

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Conclusions—Independent of deployment-related exposures, post-deployment civilian stressors are associated with the onset of alcohol use disorder among reserve-component soldiers. Concerted investment to address daily civilian difficulties associated with reintegration into civilian life may be needed to prevent new cases of alcohol use disorders among returning military personnel.

Introduction

Alcohol use disorders (AUDs) are a concern among reserve-component U.S. soldiers returning from deployment. While 6.8% of the U.S. population manifested alcohol abuse or dependence in 2012,[1] 14% of reserve-component soldiers experienced alcohol abuse.[2] To address this public health problem, modifiable determinants of AUDs among reserve-component soldiers must be identified.

Exposure to life-threatening situations during and after combat[3–7] and military sexual harassment[8,9] are associated with AUDs.[6,7,10,11] The role of modifiable civilian stressors has not been investigated and may particularly affect reserve-component soldiers who return to civilian communities and employment upon return from deployment.[12,13]

This study focused on the Army National Guard and asked two questions. First, what is the relative influence of civilian stressors and deployment-related traumatic events and stressors on post-deployment AUDs among Guardsmen primarily deployed to Afghanistan and Iraq? Second, do civilian stressors differentially influence new onset versus recurrence of AUDs as compared to deployment-related traumatic events and stressors? By investigating the specific impact of civilian versus deployment-related exposures on AUD onset versus recurrent phenotypes, the study aimed to identify targets for intervention.

Methods

Ohio Army National Guard (ONG) members who served in June 2008–February 2009 (N=12,225) were contacted by mail, and a final sample of 2,616 were recruited, with a response rate of 43.2%. Similar to the ONG, the sample was predominantly male and white. The sample was slightly older than the ONG, and approximately half were married (Appendix 1). For this study, respondents were excluded if they had not been deployed by Wave 1 or declined to report deployment status, had no follow-up data, never consumed alcohol, or were missing data on AUD timing (final analytic sample=1,095, Appendix 2).

Respondents were interviewed by telephone in December 2008–November 2009, and twice yearly thereafter. The Case Western Medical Center, University of Toledo, and Columbia University IRBs approved the study.

Measures

AUD was assessed at each wave using the Mini International Neuropsychiatric Interview, following DSM-IV criteria.[14] A concurrent reappraisal by clinicians found fair agreement (κ=0.21–0.37), low-moderate sensitivity (0.4–0.6), and high specificity (0.80–0.81).

Civilian stressors related to the most recent deployment were assessed using a 12-item list (e.g., job loss, Appendix 3).[15] Respondents were classified as exposed to any versus no stressors.

Baseline measures of deployment-related events included: (1) combat-related traumatic events (e.g., receiving incoming fire); (2) post-battle traumatic events (e.g., seeing severely wounded enemy soldiers after battle); and (3) sexual harassment (e.g., unwanted groping) (Appendix 4).[16] Combat-related and post-battle traumatic events were included as tertiles ("low"=0 events, "medium"=1–2 events, and "high"= ≥3 events). Sexual harassment was classified as any versus none.

Other variables considered included age, gender, marital status, race, household income, education, family history of substance use, enlisted status, and AUD in the previous wave.[17–19]

Statistical Models

A generalized linear mixed model with a random intercept was used to estimate SEs in the presence of repeated assessments over time.[20] To identify potential confounders, a model including demographic characteristics, prior AUD, and study wave (Waves 2 and 3 versus Wave 1) was estimated.

The first question asked about the relative influence of civilian stressors and deployment-related traumatic events and stressors on post-deployment AUDs. Stressors and traumatic events were included in separate crude and adjusted models. Adjusted models included significant demographic predictors of AUD, prior AUD, and study wave. A final model included all stressors and traumatic events. Likelihood ratio tests were used to compare model fit.

The second question asked whether civilian stressors influence a different set of AUD phenotypes than deployment-related traumatic events and stressors. Models included the stressor/traumatic event of interest, prior AUD, and the interaction of the two measures as covariates. The same modeling steps were followed as those used to answer the first question.

The Proc Glimmix procedure in SAS, version 9.2 (SAS Institute Inc., Cary NC) was used to fit models. Missing data on the covariates was addressed through listwise deletion (2–4 cases dropped). Analyses were conducted in 2013.

Results

More than half (59.8%) of soldiers experienced combat-related traumatic events, 35.9% of soldiers experienced civilian stressors, and 17.0% reported sexual harassment during the most recent deployment. The past-year AUD prevalence was 13.2%, 7.1%, and 5.2% at Waves 1–3, respectively (sample characteristics listed in Appendix 5).

In separate adjusted models, experiencing at least one civilian stressor and sexual harassment were associated with higher odds of AUD; combat-related and post-battle

traumatic events were marginally associated with AUD (Table 1). In a final model, only civilian stressors were associated with AUD (associations between individual items and AUD described in Appendices 6–9).

Table 2 shows the associations between exposures to civilian stressors and deployment-related traumatic events, as well as the odds of AUD onset and recurrence. In a final model, civilian stressors and high exposure to combat-related traumatic events were associated with AUD onset.

Discussion

Civilian stressors during deployment, including family disruption, and stressors following deployment, including changes in employment status, problems with health insurance, and legal problems, are commonplace in military families.[21] Related characteristics, such as divorce and lower family income have been linked with alcohol misuse in military samples.[22,23] Civilian stressors may place an added burden upon military personnel who are already affected by deployment-related traumatic events.[24–26]

The association of deployment-related traumatic events and civilian stressors with AUDs was specific to AUD onset, suggesting that adult-onset AUDs may constitute a different phenotype from recurrent AUDs.[27,28] Previous research has identified two “types” of people with AUD:[27–29] one characterized by later onset, greater malleability to the social environment, use of alcohol for its anti-anxiety effects, and lower severity of alcohol dependence symptoms, and another characterized by early onset, high genetic diathesis, use of alcohol for its euphoric effects, and a chronic treatment history.

Study findings must be taken in context of its limitations. First, the results may be subject to recall bias. Participants who report developing alcohol problems may be more likely to remember experiencing deployment-related and civilian traumatic events and stressors.[30] However, prospective data on AUDs allows us to temporally separate reports of traumatic events and stressors from reports of AUD. Second, although the study sample was comparable to the ONG population, it was not possible to determine whether the final analytic sample was comparable to the ONG members that would have met our inclusion criteria. Third, soldiers interviewed shortly after their deployment may have been misclassified, as increased rates of psychiatric symptoms tend to arise 3–4 months after deployment.[31] Fourth, clinical reappraisal of the AUD measure found fair agreement with the self-report measure, low–moderate sensitivity, and high specificity. Hence, the study may have misclassified a number of Guardsmen as not meeting criteria for AUD. If true, these sources of misclassification would have led to an underestimation of new onset cases of AUD, biasing results toward the null.

Independent of the traumatic events and stressors faced during deployment, soldiers who experience civilian stressors are at greater risk of onset of AUDs. With more than 1.6 million service members deployed in support of war efforts Operation Enduring Freedom, Operation Iraqi Freedom, and Operation New Dawn, the need to develop a more effective reintegration response that addresses such civilian stressors is critical.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

Dr. Cerdá designed the study, interpreted the data, drafted the article, and provided final approval of the version to be published. Ms. Richards analyzed and interpreted the data, contributed to the article draft, and provided final approval of the version to be published. Mr. Cohen assisted with acquisition and analysis of the data, revised the article for important intellectual content, and provided final approval of the version to be published. Dr. Calabrese, Dr. Liberzon, and Dr. Tamburrino conceived and designed the original study, acquired the data, revised the article for important intellectual content, and provided final approval of the version to be published. Dr. Galea conceived and designed the original study, acquired the data, contributed substantially to the manuscript drafts, and provided final approval of the version to be published. Dr. Koenen designed the study, interpreted the data, drafted parts of the article, and provided final approval of the version to be published.

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Table 1

Deployment-related and civilian events associated with alcohol use disorders among Ohio National Guard members

	Crude models[a]			Single exposure–adjusted models[b]				Fully adjusted model[c]			
	OR	**95% CI**	***p*-value**	**OR**	**95% CI**	***p*-value***	**LRT***	**OR**	**95% CI**	***p*-value**	**LRT****
Civilian stressors			**<0.01**			**<0.01**	**<0.01**			**<0.01**	0.40
None	ref			ref				ref			
Any	3.81	2.40, 6.06		2.25	1.61, 3.16			2.07	1.46, 2.94		
Peri-deployment events											
Combat			**0.02**			0.08	**<0.01**			0.53	**<0.01**
Low	ref			ref				ref			
Medium	1.44	0.81, 2.53		1.27	0.83, 1.91			1.04	0.66, 1.65		
High	2.14	1.27–3.61		1.56	1.07, 2.28			1.28	0.79, 2.10		
Post-battle			**0.01**			0.08	**<0.01**			0.88	**<0.01**
Low	ref			ref				ref			
Medium	1.83	1.05, 3.20		1.46	0.97, 2.18			1.11	0.70, 1.78		
High	2.04	1.19, 3.52		1.48	1.00, 2.20			1.02	0.61, 1.69		
Sexual harassment			**0.01**			**0.03**	**<0.01**			0.16	**<0.01**
None	ref			ref				ref			
Any	2.21	1.27, 3.85		1.58	1.04, 2.39			1.36	0.89, 2.08		

Note: Boldface indicates statistical significance ($p<0.05$).

[a] Crude models include only the civilian stressor or peri-deployment traumatic event and no other variables.

[b] Single exposure–adjusted models include a single civilian stressor or peri-deployment traumatic event, plus alcohol use disorder history at the prior wave, study wave, age, gender, and marital status.

[c] The fully adjusted model includes civilian stressor or the peri-deployment traumatic event, alcohol use disorder history at the prior wave, and are adjusted for all other civilian stressors and peri-deployment events, wave, age, gender, and marital status.

* *p*-value for an LRT, which compares a crude model including only the civilian stressor or peri-deployment traumatic event to a model also adjusted for alcohol use disorder history at the prior wave, study wave, age, gender, and marital status.

** *p*-value for an LRT, which compares a single exposure–adjusted model to a fully adjusted model with all stressors and peri-deployment events included.

LRT, likelihood ratio test

Table 2

Deployment-related and civilian events associated with alcohol use disorder onset and recurrence, Ohio National Guard members

	Crude models[a]			Single exposure–adjusted models[b]				Fully adjusted model[c]			
	OR	**95% CI**	***p*-value***	**OR**	**95% CI**	***p*-value***	**LRT****	**OR**	**95% CI**	***p*-value***	**LRT*****
Civilian stressors			**0.03**			**0.03**	**<0.01**			**0.03**	**0.02**
For recurrent cases of alcohol use disorder	1.62	1.11, 2.36		1.47	1.00, 2.17			1.52	1.02, 2.27		
For new onset cases of alcohol use disorder	3.02	1.97, 4.63		2.84	1.85, 4.37			2.41	1.54, 3.77		
Peri-deployment events											
Combat			**<0.01**			**<0.01**	**<0.01**			**<0.01**	**<0.01**
For recurrent cases of alcohol use disorder											
High combat exposure	0.99	0.64, 1.53		0.83	0.53, 1.31			0.80	0.45, 1.44		
Medium combat exposure	0.93	0.57, 1.50		0.85	0.51, 1.40			0.79	0.47, 1.37		
For new onset cases of alcohol use disorder											
High combat exposure	2.90	1.73, 4.83		2.84	1.70, 4.74			2.08	1.09, 3.97		
Medium combat exposure	1.69	0.94, 3.02		1.86	1.04, 3.34			1.49	0.78, 2.84		
Post-battle			**0.04**			**0.02**	**<0.01**			**0.03**	**<0.01**
For recurrent cases of alcohol use disorder											
High post-battle exposure	1.06	0.62, 1.79		0.86	0.50, 1.46			0.93	0.51, 1.71		
Medium post-battle exposure	1.23	0.71, 2.11		1.00	0.58, 1.73			1.02	0.58, 1.79		
For new onset cases of alcohol use disorder											
High post-battle exposure	2.52	1.47, 4.33		2.51	1.46, 4.32			1.13	0.60, 2.14		
Medium post-battle exposure	1.99	1.13, 3.49		2.07	1.18, 3.63			1.22	0.67, 2.23		

Note: Boldface indicates statistical significance.

[a] The crude models include the civilian stressor or the peri-deployment traumatic event, alcohol use disorder history at the prior wave, and their interaction term(s).

[b] The single exposure–adjusted models include the civilian stressor or the peri-deployment traumatic event, alcohol use disorder history at the prior wave and their interaction term(s), and are adjusted for wave, age, gender, and marital status.

[c] The fully adjusted models include civilian stressor or the peri-deployment traumatic event, alcohol use disorder history at the prior wave, and their interaction term(s), and are adjusted for all other civilian stressors and peri-deployment events, wave, age, gender, and marital status.

* *p*-values are for the interaction term(s).

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** *p*-values for an LRT, which compares the single exposure interaction–adjusted model to the crude single exposure–interaction model.

*** *p*-values for an LRT, which compares the fully adjusted interaction model to the single exposure interaction–adjusted model.

LRT, likelihood ratio test