

Substance Use Comorbidity among Veterans with Posttraumatic Stress Disorder and Other Psychiatric Illness

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There is considerable concern about the emergence of significant substance abuse among younger veterans of war in the Middle East, especially among those with Posttraumatic Stress Disorder (PTSD), but little information exists on the magnitude of this problem. Using national administrative data from the Department of Veterans Affairs (VA) (n = 1,001,996), we examined rates of diagnosed substance use disorders in Veterans who served in Iraq and Afghanistan diagnosed with PTSD compared to other psychiatric disorders; and compared rates among veterans of other service eras. Of VA patients with a selected mental disorder, 21.0% had a comorbid substance diagnosis. Veterans who served in the post-Vietnam era (VET) (1973–1991) had the highest rates of comorbidity. Logistic regression models indicated that veterans with each selected psychiatric diagnosis were significantly more likely to be dually diagnosed in comparison to veterans with PTSD; post-Vietnam veterans were significantly more likely to be dually diagnosed than veterans from other eras. Bipolar disorder and schizophrenia are most strongly associated with dual diagnosis in OEF/OIF (Operation Enduring Freedom/Operation Iraqi Freedom) veterans. There are high rates of substance use disorders among veterans with mental illness. The highest rates of comorbidity occur among those with bipolar disorder and schizophrenia; and in post-VET veterans. (Am J Addict 2011;20:185–189)

INTRODUCTION

There is considerable concern about substance abuse and its consequences among veterans with Posttraumatic Stress Disorder (PTSD), particularly those who have recently served in Iraq and Afghanistan. The popular press has featured articles with titles such as “After the Battle, Fighting the Bottle at Home” and “Home from the War, Many Veterans Battle Substance Abuse” and drawn attention to associated violence and legal problems among

returning troops. They also suggest that substance use disorders may disproportionately affect veterans from the current conflicts, and especially those veterans who also have psychological problems. However, actual rates of substance use disorders among veterans with PTSD and other mental illnesses are not well documented and there are limited data comparing veterans of recent conflicts with those of earlier wars.

Epidemiologic studies have consistently shown that the presence of a psychiatric disorder significantly increases the risk of comorbid substance abuse in the general population. The National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) found a 12-month prevalence of any substance use disorder of 9.4%; most of which is accounted for by alcohol-use disorders, which affected 8.5% of the general population.¹ Independent mood and anxiety disorders were strongly and consistently related to alcohol- and drug-use disorders, with rates of comorbid substance use disorders, 20.0% and 15.0% for those with mood and anxiety disorders, respectively. In the Epidemiologic Catchment Area (ECA) study, which examined lifetime prevalence, the highest rate of *lifetime* substance use disorders occurred in those with serious mental illness, including Bipolar I disorder (rate of 60.7%), followed closely by those with schizophrenia (47.0%).² The National Comorbidity Survey (NCS) estimated that in the population with PTSD, lifetime prevalence of comorbid substance use disorders is 22.0%.³

Veterans of war-zone service may have rates of psychiatric illness and substance use disorders that differ from the general population, including PTSD among those exposed to war-zone stress.⁴ Substance-abuse prevalence, especially among those who have other psychiatric illnesses, is harder to determine. In one small study of veterans who served in Vietnam (n = 311), those who had a diagnosis of PTSD were no more likely to have either a current (23.0% vs. 20.0%) or a lifetime (93.0% vs. 90.0%) substance use disorder than those without PTSD; however, rates were higher than those described in the general population. It should be noted, however, that war-zone substance use disorders

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can remit over time, as some individuals “recover” when they leave the war zone.⁵

Understanding the rates of substance use disorders, particularly among those with psychiatric comorbidity, is clinically relevant in order to understand the psychiatric needs of recent veterans and in planning for treatment services. Veterans from the current conflicts differ in some respects from veterans from previous eras,⁶ and comparing the rates of substance-abuse comorbidity is one step in understanding and designing specialty treatment programs for this group.

The present study uses national administrative data from the Department of Veterans Affairs (VA) covering all veterans who received services from VA outpatient clinics in FY 2008, to identify the treated prevalence of substance abuse among veterans with PTSD and other psychiatric diagnoses and among veterans who served during the Persian Gulf era as compared to those who served in earlier eras. We used multiple regression analysis to identify the independent effects on the risk of substance abuse of PTSD, other psychiatric diagnoses, and service era as well as other potentially confounding factors such as age, race, gender, and recent inpatient service use.

METHODS

Sample, Sources of Data

Using a registry of all patients treated in VA facilities during a 1-year interval (October 1, 2007–September 30, 2008), we identified those patients who served in the Vietnam era (VET) or later, and who had a primary or secondary diagnosis of major depression, bipolar disorder, schizophrenia, PTSD, dysthymia, or an anxiety disorder. The registry was compiled from the Outpatient Care File and the Decision Support Systems (DSS) Encounter File, national databases of information concerning all outpatient services delivered in the VA; and the Patient Treatment File, which compiles discharge abstracts on all episodes of VA inpatient care. All veterans who came to at least one outpatient visit or who had at least one bed day of care, and who had one of the mental health diagnoses listed above as either a primary or secondary diagnosis were included in the analysis ($n = 1,001,996$). All data were collected in the 1-year interval and represented diagnoses coded during this time.

Measures

Once the sample was identified, a dichotomous variable was created to identify those who additionally had been diagnosed with a substance use disorder, defined as individuals who had at least one encounter or bed day with an alcohol- or drug-related diagnosis. International Classification of Diseases (ICD-9) codes included 303.xx or 305.00, 292.01–292.99 or 304.xx or 305.20–305.99, 295.xx, 296.0x,

296.1x, 296.40–296.89, 296.2–296.39, 309.81, 300.xx excluding 300.4. The final sample consisted of 213,442 (21.3%) veterans who were dually diagnosed with a psychiatric and substance use disorder, and 788,554 (78.7%) veterans who had a psychiatric diagnosis alone.

Data on patient characteristics such as age, income, gender, ethnicity, receipt of VA compensation or pension, and service-connected disability were also derived from the VA workload databases. Using the zip code of residence and data from the American Hospital Association annual survey, the distance from the centrum of the patient's zip code to the nearest VA hospital or Community Based Outpatient Clinic (CBOC) was calculated. This variable is commonly used as a measure of geographic access to VA care.

War era was determined using a combination of data indicating the era of service from the electronic medical record and recent service in the Middle East from a specific registry of veterans who have returned from Iraq and Afghanistan compiled by the Department of Defense. The sample was restricted to veterans who served in the VET or later, since these veterans comprise the vast majority of current VA patients diagnosed with mental illness. Veterans were, thus, divided into VET (1964–1975), post-Vietnam (1975–1991), Gulf War/Persian Gulf (1991–present), and OEF/OIF (veterans who served in Operation Enduring Freedom or Operation Iraqi Freedom since 2001, a subset of veterans of the Gulf era).

Analysis

Analysis proceeded in several steps. First, chi-square and t -tests were used to evaluate whether veterans who were dually diagnosed were significantly different from those who were not dually diagnosed on demographic or clinical characteristics.

Logistic regression was then used to evaluate the independent relationship of specific psychiatric disorders to the risk of being dually diagnosed controlling for other potentially confounding factors such as age, race, gender, marital status, income, and use of specialty mental health services. War era was added to this model to evaluate whether era affected the rates of comorbid substance abuse. Finally, an interaction term was added to the model to determine whether the association between individual psychiatric diagnoses and the risk of substance use disorder differed across war eras, controlling for other demographic characteristics.

RESULTS

A total of 1,001,996 VA patients were diagnosed with one of the six designated mental disorders. The sample was predominately male (89.5%), which is consistent with the characteristics of the veteran population. The average age was 52.7 years ($SD = 11.9$). A total of 64.2 percent

TABLE 1. Characteristics of veterans with psychiatric disorders treated in VA, stratified by dual diagnosis

Variable		No substance abuse		Substance abuse		χ^2
		N (%)	Mean (SD)	N (%)	Mean (SD)	
Age	—	—	52.7 (11.9)	—	50.8 (10.5)	4,624.9*
Annual income	—	—	25,413.5 (45,009.6)	—	17,959.6 (31,739.2)	5,159.3* 5,159.3*
Gender	Female	93,531 (11.9)	—	12,010 (5.6)	—	—
	Male	695,023 (88.1)	—	201,432 (94.4)	—	—
Race	White	197,373 (25.0)	—	51,684 (24.2)	—	11,184.8*
	Hispanic White	19,494 (2.5)	—	5,278 (2.5)	—	—
	Black	50,560 (6.4)	—	28,312 (13.3)	—	—
	Hispanic Black	1,432 (0.2)	—	419 (0.2)	—	—
	Asian	1,876 (0.2)	—	315 (0.1)	—	—
	American Indian	1,315 (0.2)	—	574 (0.3)	—	—
	Unknown	516,388 (65.5)	—	126,838 (59.4)	—	—
Marital status	Married	409,051 (51.9)	—	62,810 (29.4)	—	36,054.5*
	Divorced	199,155 (25.3)	—	80,631 (37.8)	—	—
	Never married	147,759 (18.7)	—	61,719 (28.9)	—	—
	Widowed	18,801 (2.4)	—	5,662 (2.7)	—	—
	Unknown	13,770 (1.7)	—	2,615 (1.2)	—	—
Service connected	Yes	442,889 (56.2)	—	90,187 (42.3)	—	13,056.0*
	No	345,665 (43.8)	—	123,255 (57.7)	—	—
Era of service	Vietnam	468,078 (59.4)	—	116,376 (54.6)	—	7,517.8*
	Post-Vietnam	154,034 (19.6)	—	59,902 (28.1)	—	—
	Persian Gulf	99,027 (12.6)	—	22,712 (10.6)	—	—
	OEF/OIF	66,464 (8.4)	—	14,328 (6.7)	—	—
Mental health use	Yes	556,766 (70.6)	—	191,048 (89.5)	—	31,700.4*
	No	231,788 (29.4)	—	22,394 (10.5)	—	—
PTSD	Yes	319,513 (40.5)	—	88,315 (41.4)	—	51.2*
	No	469,041 (59.5)	—	125,127 (58.6)	—	—
Unipolar affective disorders	Yes	479,233 (60.8)	—	147,816 (69.3)	—	5,158.0*
	No	309,321 (39.2)	—	65,626 (30.7)	—	—
Anxiety disorders	Yes	204,517 (25.9)	—	59,338 (27.8)	—	301.1*
	No	584,037 (74.1)	—	154,104 (72.2)	—	—
Bipolar disorder	Yes	57,508 (7.3)	—	30,613 (14.3)	—	10,407.6*
	No	731,046 (92.7)	—	182,829 (85.7)	—	—
Schizophrenia	Yes	57,879 (7.3)	—	22,447 (10.5)	—	2,298.9*
	No	730,675 (92.7)	—	190,995 (89.5)	—	—

* $p < .0001$.

of the sample were Caucasian, 24.9% were African American, 7.9% were Hispanic, and 3.1% were identified as other or race unknown. The sample includes 80,792 (8.1%) veterans who served in OEF/OIF; 121,739 (12.2%) from the Persian Gulf War era (PER); 213,936 (21.4%) from the post-VET; and 584,454 (58.4%) from the VET. A total of 213,442 (21.0%) veterans were dually diagnosed, compared to 788,554 veterans who were not dually diagnosed.

Dually diagnosed veterans differed significantly from non-dually diagnosed veterans on all variables, although the large sample size allows small differences to be statistically significant (see Table 1). Those with affective disorders, anxiety disorders, bipolar disorder, and schizophrenia

were all significantly more likely to have a substance use disorder than veterans without each of those disorders. Those with PTSD, however, were only slightly more likely to be dually diagnosed than those without PTSD (21.7% vs. 21.1%). Males were significantly more likely to be dually diagnosed, as were minority veterans, unmarried veterans, and those with no service-connected disabilities (note that veterans cannot receive disability status for a substance use disorder). The highest rates of dual diagnosis (28.0%) were observed among veterans of the post-VET, the period corresponding to the beginning of the all-volunteer military. Those who were dually diagnosed were also significantly younger and had substantially lower annual incomes than non-dually diagnosed veterans.

TABLE 2. Logistic regression models predicting dual diagnosis, adjusted for demographics

Variable	Model 1		Model 2	
	Odds ratio	<i>p</i>	Odds ratio	<i>p</i>
Affective disorders	1.66	<.0001	1.63	<.0001
Anxiety disorders	1.15	<.0001	1.14	<.0001
Bipolar disorder	1.92	<.0001	1.83	<.0001
Schizophrenia	1.11	<.0001	1.05	<.0001
Post-Vietnam	—	—	1.04	<.0001
Persian Gulf	—	—	.66	<.0001
OEF/OIF	—	—	.47	<.0001

Diagnoses are compared to PTSD, era is compared to Vietnam.

Logistic regression models indicated that veterans with each psychiatric diagnosis were significantly more likely to be dually diagnosed in comparison to veterans with PTSD. For example, those with bipolar disorder were 1.92 times more likely than veterans with PTSD to be dually diagnosed, adjusting for other demographic characteristics, and those with affective disorders were 1.66 times more likely to be dually diagnosed. The second model in Table 2 indicates that these associations were slightly attenuated by the addition of war era to the model, with post-Vietnam veterans significantly more likely to be dually diagnosed than VET veterans, and veterans of other eras significantly less likely to be dually diagnosed.

Interaction terms between war era and clinical diagnoses were statistically significant. Models of the risk of being dually diagnosed are presented in Table 3, stratified by war era. Here, we see differing strengths of association between diagnoses and dual diagnosis, depending on the era. For example, affective disorders, in comparison to PTSD, are most strongly associated with dual diagnosis among post-Vietnam and OEF/OIF veterans, while anxiety disorders are most strongly associated with dual diagnosis among Persian Gulf veterans. Bipolar disorder and schizophrenia are both most strongly associated with dual diagnosis in OEF/OIF veterans, compared to those with PTSD.

DISCUSSION

The results of this study suggest that among veterans diagnosed with selected mental illnesses in the VA health-care system: (1) there are high rates of substance use disorders among those with mental illness, ranging from 21–35% across major diagnostic groups; (2) the highest rates of comorbidity occur among those with bipolar disorder and schizophrenia; and (3) there are differences in rates of comorbidity in veterans of different war eras. One unexpected finding is the *relatively* lower rate of comorbidity among those with PTSD, especially in comparison to those with other mental disorders. These findings may be helpful in designing programs to meet the needs of veterans of different war eras.

High rates of substance abuse are still found among veterans, particularly those with comorbid mental illness. Not surprisingly, the highest rates of comorbid substance use disorders occur among those with serious mental illness including bipolar disorder and schizophrenia. The high rates are consistent with findings in the general population² and in clinical populations.⁷ What was surprising is the relatively low rate of comorbid substance abuse in those with PTSD compared to those with other psychiatric disorders. This was true among all veterans, including those veterans from the current conflicts. These results should not suggest that comorbidity with substance abuse is not a clinically significant issue. Both clinical experience and research evidence have shown that there are high rates of substance abuse among veterans who suffer from PTSD⁸ and they have a worse clinical prognosis than those who have PTSD alone.⁹ Results from these studies suggest that rates of comorbidity were higher in those from the post-VET, among minority veterans and in those with lower income. Whether low incomes represent a risk or consequence of substance abuse cannot be determined from these data.

The highest rates of dual diagnosis occurred in the post-VET veterans. Whether this is a reflection of a decrease in substance use in general or other factors, is not clear. There is some evidence that drug use is changing among military personnel for the better. Perhaps due in part to the “zero tolerance” with respect to drug use, surveys of military personnel have shown that illicit drug use has decreased from 1980 to 1995.¹⁰ Cigarette use has also similarly declined,

TABLE 3. Odds ratios for the association between diagnosis and dual diagnosis, stratified by period of service

	Vietnam		Post Vietnam		Persian		OEF/OIF	
	OR	<i>p</i>	OR	<i>p</i>	OR	<i>p</i>	OR	<i>p</i>
Affective disorders	1.48	<.0001	1.93	<.0001	1.66	<.0001	1.89	<.0001
Anxiety disorders	1.10	<.0001	1.18	<.0001	1.25	<.0001	1.17	<.0001
Bipolar disorder	1.58	<.0001	2.07	<.0001	2.12	<.0001	2.51	<.0001
Schizophrenia	.94	<.0001	1.20	<.0001	1.22	<.0001	1.86	<.0001

Diagnoses are compared to PTSD.

although alcohol use has not. Heavy alcohol use is higher in each branch of the military for men and is higher in the Navy and Marines for women, compared to their civilian counterparts, respectively.¹¹ Despite some promising data, surveys of returning veterans from the current conflicts suggest that substance-abuse disorders are still affecting large numbers of veterans.^{12–14}

Limitations of this study include the reliance on administrative data, which is not based on validated diagnostic assessments by trained personnel. Further, this study only addressed prevalence rates of comorbid disorders for a 1-year period and did not provide information on clinical severity, such as level of symptomatology or prognosis. Nevertheless, the use of administrative data provides information from all veterans treated in facilities throughout the country, and provides a comprehensive “snapshot” of the clinical needs of veterans cared for by the Veterans Administration.

This study represents one of the few studies evaluating substance use prevalence among veterans and compares rates among those with different psychiatric comorbidity and among those from different eras. The results from this study might be useful in program planning and for understanding the needs of veterans of different eras. For example, in determining the needs of veterans from the current conflicts, it seems that those with serious mental illness are particularly in need of services to address a comorbid substance use disorder. It should be noted that PTSD does occur more commonly than do the other serious psychiatric disorders, so resources to treat PTSD and its comorbidity are still highly important. It does suggest that OEF/OIF veterans should likely be screened for serious mental illness in addition to screening for PTSD.

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