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Relationship Between Anger, Alcoholism and Symptoms of Posttraumatic Stress Disorders in War Veterans

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Purpose: Studies among veterans indicate that veterans with posttraumatic stress disorder (PTSD) express anger, hostility and aggression as well as alcohol and substance abuse more than veterans without PTSD. The aim of this study was to analyze the relationship between anger, use of alcohol and symptoms of PTSD in war veterans in Bosnia and Herzegovina (B&H). **Method:** Comparing a group of veterans (n=54) with PTSD who use alcohol and a group of veterans (n=46) who do not use alcohol, the analyzed were dimensions of anger related to PTSD symptoms and alcohol usage. Medical records of patients treated at the Department for Psychiatry in Tuzla, B&H, Harvard Trauma Questionnaire (HTQ) – version for Bosnia and Herzegovina, State-Trait Anger Expression Inventory (STAXI), Structured Clinical Diagnostic Interview (SCID-I) were used in this study. The basic socio-demographic data were also collected. **Results:** A significant correlation is found between alcohol usage, and state and trait of anger ($P<0.001$), angry temperament ($P = 0.001$), anger-in expression ($P<0.001$), anger-out expression ($P<0.001$), and anger control ($P<0.001$). PTSD hyperarousal cluster symptoms were significantly correlated to state anger, anger-in expression ($P<0.05$), and use of alcohol ($P=0.010$). **Conclusion:** The results indicate that there is a significant correlation between PTSD arousal symptom with anger dimensions, as well as between anger dimensions and use of alcohol in war veterans with PTSD. Key words: Alcohol Use, PTSD Symptoms, Anger

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1. INTRODUCTION

Posttraumatic stress disorder is frequently co-morbid with other psychiatric disorders (1, 2). Patients with PTSD often use alcohol or other psychoactive substances in order to cope with co-morbid problems such as anxiety or depression (3, 4), or as a way of reducing distress related to particular PTSD symptoms. Some studies point to the existence of high prevalence of

aggression, and a connection of anger and aggression with PTSD symptoms (5). Symptoms of PTSD intermediate in the relation between trauma severity and the expression of both verbal and physical aggression (6). A significant number of studies have found a connection between PTSD symptoms in war veterans and aggressive behavior in partners' relationship (7, 8). War veterans' social functioning is consider-

ably affected by relation between PTSD symptoms and the use of alcohol or psychoactive substances (9, 10). The alcohol use in war veterans with PTSD is interconnected with low quality of life (11). Recent study on U.S. soldiers returnees from Iraq in which demographic characteristics of the investigated groups of soldiers were very similar, point to a significantly high level of PTSD, depression and alcohol abuse, as well as to a significant presence of stigma linked to seeking help in mental health services (12,13). The incidence of aggressive and violent behavior in war veterans varies, while studies suggest that it is significantly higher in war veterans with PTSD. The predominant forms of aggressive behavior include auto-aggressive behavior and hetero-aggressive pattern with dominant verbal aggression and impulsive reactions. The level of education, low socio-economic status, childhood abuse, and prior violent behavior showed to be of importance for later occurrence of the aggressive behavior (14). Most studies show a high rate of PTSD symptoms, depression, and use of alcohol in war veterans (1, 3, 10), while difficulties related to anger in war veterans were much less analyzed (15). Chemtob et al. (16) report on a lack of empirical data on the relation between combat-related PTSD and increase in anger. Persons with PTSD symptoms have difficulties in anger control (17). Anger might be a very difficult emotion to deal with, and may

lead to a number of juridical and interpersonal problems (15). In DSM-IV TR (18) the anger is considered to be a possible symptom of PTSD. Angry ruminations and verbal expression contribute to PTSD symptoms maintenance. Several authors have recommended that treatment of PTSD should include anger management in certain groups of PTSD patients (19). The aim of this study is to determine the relationship between the anger and ways of anger expression, as well as the use of alcohol and PTSD symptoms in war veterans from Bosnia and Herzegovina.

2. SUBJECTS AND METHODS

The subjects enrolled in this study were male war veterans of the Army of Bosnia and Herzegovina, with the average age of 42.84 ± 4.66 years, who did not use alcohol before the war and were hospitalized at the Department for Psychiatry in Tuzla during 2003, when diagnosed with combat-related PTSD according to DSM-IV criteria (18). This research is carried out in the period from September 2004 to February 2005. Data were collected from the admission protocols and medical records. Out of 1166 patients treated in 2003, the 130 (11.2%) were war veterans with PTSD. Their addresses were taken from the protocols and the letter about objectives of this research with a form of voluntary consent was sent via post office. The letter included the info about time schedule ascertained for each veteran as well as the place of investigation and travel costs to be covered. Psychometric tests and clinical assessment is done by clinical psychiatrist and psychologist who did not treat these patients previously. Out of 130 invited veterans, 113 responded among which 6 did not meet the inclusion criteria (4 used alcohol before the war, and 2 were older than 55). During the study procedure, 7 out of 107 war veterans dropped out for various reasons, and the investigated group of veterans with PTSD used some of psychotropic drugs in that period. All veterans used anxiolytics and sedatives, 49 used low dosages of atypical antipsychotics (Risperidon 1 to 2 mg a day), 70 used antidepressants (Paroxetine, Setralin, Fluoxetine). Veterans who use alcohol were taking psycho-

tropic drugs on their own initiative out of recommended protocol, and temporarily taking anxiolytics with alcohol. After discharge 66 veterans were subject to a regular out-patient psychiatric treatment.

3. MEASURES

The State-Trait Anger Expression Inventory (STAXI), which provides relatively brief and objectively scored measures of anger experience, expression and anger control, was used for the assessment of anger (20). The STAXI consists of 44 items administered in three parts and distributed across five main scales. In accordance with the above mentioned concept of anger, there exist three main aspects of the STAXI scales: State, Trait, and Anger Expression. Part 1 consists of 10 items to assess the State Anger. Part 2 contains 10 items to measure the Trait Anger. Trait contains two subscales to investigate different dispositions in trait anger—temperament and reaction. Part 3 consists of 24 items to measure Anger Expression. Anger Expression is an experimental composite of the three expression constructs In, Out, and Control. All items are rated on a four-point scale and assigned a score between 1 and 4. Trait-anger items are rated on 4-point scales from „almost never“–1 to „almost always“–4, and the state-anger items are rated on the intensity of feelings from „not at all“–1 to „very much so“–4. The coefficient of reliability for the trait-anger subscale was 0.91, for the state-anger subscale 0.82, and for the anger expression it was 0.79. The index of anger expression is being measured, which enables measuring the total anger expression, levels from 0–1.4 being low, 1.5–2.4 moderate, 2.5–3.4 high and 3.5–4.4 extremely high. Levels of anger expression were determined according to percentile range. Values

of anger expression that fall to percentile 5 to 25 are considered to be low; values that fall to percentiles 50 to 75 are moderate; values to percentiles 75 to 90 are considered to be high, and values to percentiles 95 extremely high.

In order to determine alcohol consumption, the Structured clinical interview for DSM-IV, Axis I disorders (SCID-I), and application form for alcohol related disorder (21) were used. The interview format for the SCID includes an initial screen for evidence of any lifetime excessive drinking, followed by items for specific diagnoses of alcohol abuse and addiction. Each item is scored 1 – not present, 2 – mildly present or unclear or 3 – present. Every interview took about one hour. To evaluate traumatic events and the presence of PTSD, as well as the expressiveness of PTSD symptoms, a self-rating Harvard

Characteristics	No of war veterans (N=100)
Nationality	
Bosniaks	98
Serbs	2
Religion affiliation	
Islamic	96
Orthodox	2
Atheist	2
Marital status	
Married	82
Divorced	6
Widowed	4
Single	8
Education	
No education	10
Elementary	30
Secondary School	56
University degree	4
Employment status	
Employed	62
Unemployed	38
Alcoholism in family	
Present	40
Not present	60
Traumatic events	
Wounding	18
Death of the closest	22
Drawing a wounded and killed persons	94
Exposure to a heavy shelling	100
Being captured	10
Persecution	14
Witnessing death of other soldiers	92

TABLE 1. Socio-demographic characteristic of Bosnian and Herzegovina war veterans (N=100) with Posttraumatic Stress Disorders

Trauma Questionnaire (HTQ), Bosnia and Herzegovina Version (22) was used. For identified traumatic event, the respondents were asked: "How do you feel when you remember that?", rated on a 0-5 scale: 0 – No feeling, 1 – a bit upset, 2 – somewhat upset, 3 – moderately upset, 4 – seriously upset, and 5 – extremely seriously upset. Another part of the questionnaire contained a 16-item scale for measuring PTSD symptoms and the presence of PTSD. Stress level was defined as the frequency of each PTSD symptom in the last month, assessed on the 0 – 5 scale by determining its occurrence: 0 – not at all, 1 – almost never, 2 – sometimes, 3 – moderately, 4 – often and 5 – almost every day. To collect socio-demographic data, a questionnaire designed for this research was used; it contained questions related to general socio-demographic data and questions about family history of alcoholism.

4. DATA ANALYSES

A nonparametric Mann-Whitney test was used for the statistic analysis of differences between the groups in results of answers to questions about socio-demographic data (age, employment, education, marital status, employment of the partner, alcoholism in family). The difference between groups in stress levels, intensity of PTSD symptoms, number of traumatic events, and the score of index' of the subscale anger was analyzed by the factorial ANOVA model. The relation between dimensions of anger, use of alcohol, and PTSD symptoms was analyzed with the Pearson correlations. Collected data were statistically analyzed using the Windows Statistical Package for Social Sciences, version 10.0 (SPSS, Chicago, IL, USA).

5. RESULTS

Most subjects in this study were married, employed, of secondary school educational level, with no family history of alcoholism (Table 1). Average number of reported traumatic events was 4.8 ± 1.75 , where witnessing death or wounding of soldier mates prevail (Table 1). In total sample of the veteran group the mean of PTSD symptoms intensity was 3.37 ± 0.41 , the mean

Anger Dimensions	No of war veterans related to level of anger expression*			
	Low (0-1.4)	Moderate (1.5-2.4)	High (2.5-3.4)	Extremely (3.5-4.4)
State anger	23	46	28	-
Trait anger	2	80	16	2
Angry temperament	6	66	28	-
Angry reaction	4	56	38	2
Anger expression	-	92	8	-
Anger-in	2	78	20	-
Anger-out	10	66	24	-
Anger controlž	8	42	40	6

* Levels of anger expression were determined according to percentile range; values of anger expression that fall to percentile 5 to 25 are considered to be low; values that fall to percentiles 50 to 75 are moderate; values to percentiles 75 to 90 are considered to be high, and values to percentiles 95 extremely high

TABLE 2. Level of anger expression index measured by the State Trait Anger Expression Inventory (STAXI) in Bosnian war veterans with Posttraumatic Stress Disorder (N = 100)

Dimensions of anger	War veterans with PTSD (N=100)					
	Who use alcohol (n=54) M4SD	Who do not use alcohol(n=46) M4SD	Type III Sum of Square	Mean Square	F	P
State anger	2.1440.61	1.5640.37	5.33	1.77	6.08	0.001
Trait anger	2.3140.45	1.8640.41	3.41	1.13	6.41	0.001
Angry temperament	2.2940.55	1.8040.45	3.54	1.18	4.44	0.008
Angry reaction	2.3640.46	2.1140.57	2.25	0.75	3.03	0.038
Anger expression	2.2240.11	2.1540.14	0.13	4.52E-02	2.81	0.050
Anger-in	2.2940.26	2.0040.26	1.26	0.42	5.97	0.002
Anger-out	2.3240.42	1.7140.30	5.12	1.70	12.53	<0.001
Anger control	2.1040.67	2.7540.55	6.72	2.24	6.06	0.001

PTSD- Posttraumatic Stress Disorder, M=mean, SD=standard deviation, F value for factorial ANOVA

TABLE 3. The mean of anger scores and differences in dimensions of anger measured by the State Trait Anger Expression Inventory (STAXI) in Bosnian war veterans with Posttraumatic Stress Disorder who use alcohol (n=54) and do not use alcohol (n=46)

of stress level was 2.56 ± 0.73 , while the mean scores of clusters of intrusive symptoms was 2.78 ± 0.57 , avoidance symptoms 2.93 ± 0.47 , and arousal symptoms 2.46 ± 0.76 . According to SCID-I interview criteria, in the 12-month-period prior to this study, 54 veterans with PTSD used alcohol, and 46 did not use alcohol. There was no statistically significant difference related to age (43.56 ± 4.94 vs. 42.00 ± 4.84 , $F = 1.394$, $P = 0.244$) between war veterans with PTSD who used alcohol and those who did not use alcohol. Using Mann-Whitney test, no significant difference is found between those two groups related to marital status ($Z = -0.422$, $P = 0.673$), level of education ($Z = -1.199$, $P = 0.230$), employment rate ($Z = -0.729$, $P = 0.466$), and family history on alcoholism ($Z = 1.119$, $P = 0.263$). No significant difference is found using Factorial ANOVA analysis in severity of PTSD symptoms ($F = 0.268$, $P = 0.848$), the intrusive symptoms ($F = 0.404$, $P = 0.254$), the avoidance

symptoms ($F = 1.625$, $P = 0.197$), hyperarousal symptoms ($F = 2.754$, $P = 0.053$), and the number of traumatic events ($F = 1.973$, $P = 0.131$). Linear regression showed significant correlation between alcohol usage and the number of traumatic events ($r = 0.334$, $P = 0.009$), intrusive symptoms ($r = 0.249$, $P = 0.041$), avoidance symptoms ($r = 0.309$, $P = 0.014$), and hyperarousal symptoms ($r = 0.384$, $P = 0.003$). However, there was no significant relation between the number of traumatic events and intrusive symptoms ($r = 0.039$, $P = 0.393$), avoidance symptoms ($r = 0.133$, $P = 0.178$), and hyperarousal symptoms ($P = 0.059$, $P = 0.342$).

Out of total 100 war veterans with PTSD, a high and an extremely high level of trait anger was found in 18 veterans, a high level of anger-out expression was found in 24, anger-in expression a high in 20, and anger control a high to extremely high level in 46 war veterans (Table 2). Multivariate analy-

sis used for fixed factors of alcohol usage found a significant difference in the dimensions of anger between war veterans with PTSD who use alcohol and those who not use alcohol (Table 3). In relation to cluster symptoms of PTSD and dimensions of anger, using linear regression it is found a significant correlation between hyperarousal symptoms and the state anger ($r=0.285$, $P=0.022$), and angry temperament ($r=0.270$, $P=0.029$), anger expression ($r=0.342$, $P=0.008$), and anger-out expression ($r=0.279$, $P=0.025$), while between intrusive symptoms, avoidance symptoms and dimensions of anger there was no significant correlation. A significant correlation is found by linear regression between the number of traumatic events and state anger ($r=0.267$, $P=0.031$), angry temperament ($r=0.266$, $P=0.031$), anger-out expression ($r=0.354$, $P=0.006$), and anger control ($r=0.281$, $P=0.024$). There was no significant correlation between the intensity of PTSD symptoms and state anger ($r=0.027$, $P=0.425$), trait anger ($r=0.023$, $P=0.437$), angry temperament ($r=0.021$, $P=0.443$), angry reaction ($r=0.009$, $P=0.475$), anger-in ($r=0.124$, $P=0.195$), anger-out ($r=0.142$, $P=0.163$), and anger control ($r=0.105$, $P=0.235$).

6. DISCUSSION

In this study most veterans with PTSD have had moderate to extremely high level of trait anger, angry reaction, and anger-in expression; moderate to high level of angry temperament, anger-out expression, and state anger. Moderate to high index of anger control was present in the largest number of veterans, which is opposite to expected results and results from other studies (16, 17). A significant correlation between the intensity of PTSD symptoms and score of anger dimensions is not found in this study, while a significant relation between symptoms of hyperarousal and state anger, angry temperament, anger expression and anger-out expression is found, which is similar to the results of Evans et al. (8). Also, a significant correlation is found between the number of traumatic events and state anger, angry temperament, anger-out expression and anger control. Possible explanation for the results obtained is that

this study enrolled veterans who were taking one or more psychotropic drugs during the period of investigation, and most of them underwent treatment. It is also possible that veterans are afraid of their aggressive impulses and may lack self-efficacy with regard to anger control, and therefore, they are more likely to "stuff" their anger (23).

With regard to alcohol consumption, 54 veterans from Bosnia and Herzegovina enrolled in this study used alcohol, and a significant relationship is found between PTSD symptoms and use of alcohol, which does not differ from the results obtained in previous studies (4, 10, 12, 24). It is found that war veterans with PTSD who used alcohol have had significantly higher level of the trait anger, the state anger, the angry temperament, and higher expression of anger-in and anger-out, and a weaker control of anger compared to veterans suffering from PTSD who did not use alcohol. Studies indicate that hyperarousal symptoms of PTSD are related to alcohol usage too (25, 26). The studies conducted on war veterans in Croatia (24, 27), Bosnia and Herzegovina (28), Iraq and Afghanistan (19), and Vietnam war veterans (7, 15) showed a high level of aggression in veterans with PTSD who have alcohol-related disorders. Also, Lasko et al. (29) found in Vietnam veterans that those with PTSD had a higher aggression score compared to veterans without PTSD, and that aggression intensity was determined more as a part of PTSD. The association of PTSD symptoms with aggressive behavior and directing aggression outwardly was also found in studies related to violent behavior of war veterans against their partners (8, 15), and interpersonal violence (30). However, a relationship between anger, PTSD symptoms and alcohol consumption in veterans is being analyzed in only several studies (31). No statistically significant difference is found in socio-demographic variables, number of traumatic events, stress level, and severity of PTSD symptoms between veterans with PTSD who use alcohol and those who do not use alcohol. But a significant correlation of hyperarousal symptoms and state anger, angry temperament, anger expression and anger-

out expression was found. As a symptom of PTSD, hyperarousal appears as a predictor of anger and alcoholism. It is found by Taft et al. (32) that hyperarousal symptoms were directly associated with aggression and indirectly with alcohol related-problems. Also, Savarese et al. (33) report that there is a complex interaction between hyperarousal and alcohol consumption in predicting violence. Some explanations for the connection of hyperarousal symptoms and aggressions may relate to changes in the activity of areas of the brain such as nucleus accumbens in the dominant hemisphere (34).

Based on the results obtained in this study, it can be concluded that there is a significant relationship between anger, alcohol consumption and PTSD symptoms where the cluster of hyperarousal symptoms is significantly correlated with anger dimensions and use of alcohol. It can also be concluded that exposure to a larger number of combat-related traumatic events is directly connected with alcohol usage and anger dimensions.

There were several methodological limitations in this study. Firstly, the factor related to duration and methods of treatment was not included. The study is carried out in the group of veterans who underwent in-patients treatment only with psychotropic drugs, while investigation took place one to two years after the hospitalization. Secondly, this study did not include other psychological factors such as depression and anxiety where the emotion of anger is present; and the occurrence of aggressive behavior in war veterans with PTSD who have a high index of anger and who use alcohol is not analyzed. This study indicates the need for exploring the anger related to the above mentioned factors. Also, the results of this study show that in the treatment of war veterans with PTSD it is necessary to explore the emotions of anger as important factor to managing therapeutic interventions.

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