

Posttraumatic Stress Disorder and Depression in Soldiers with Combat Experiences

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Aim. To compare psychological, medical, and trauma-related variables in veterans with combat-related post-traumatic stress disorder (CR-PTSD) comorbid with depression and veterans with CR-PTSD only.

Method. Out of 402 Croatian veterans recruited during expert evaluation for war-related compensation claims, 346 met the criteria for CR-PTSD: 97 for CR-PTSD only and 249 for PTSD comorbid with other diagnoses (77 comorbid with depression). To reach diagnosis, psychiatrists used clinical interview based on DSM-IV criteria, interview with family and friends, previous medical documentation, and Hamilton Rating Scales for Depression and Anxiety. An independent psychologist used a structured psychological interview, Mississippi CR-PTSD scale, Watson's PTSD criteria, Minnesota Multiphasic Personality Inventory-version 201, and trauma questionnaire based on the Harvard Questionnaire.

Results. Out of 402 soldiers, 13.9% did not meet the criteria for PTSD or other psychiatric diagnosis, 61.9% met the criteria for comorbid diagnoses, and 24.2% for PTSD only. The PTSD group with depression did not differ from PTSD-only group in combat experience, number of traumatic events, age, length of employment, sick leave, education, or marital status (chi-square test, $p=0.121-0.672$). The two groups differed in pre-trauma factors, such as mental disturbances before combat experiences ($p=0.003$), positive family history of psychiatric illness ($p=0.008$), primary major depression ($p=0.012$), and the number of hospital admissions ($p=0.002$).

Conclusion. Different assessment methods in expert examination of combat-experienced soldiers with PTSD for compensation-related purposes are needed to establish the final diagnosis and avoid possibility of factitious disorder or malingering. Combat ability assessment should include assessment of previous psychiatric disturbances of soldiers and their families.

Key words: comorbidity; Croatia; depression; depressive disorder; neurotic disorders; stress disorder; post-traumatic; veterans; veterans disability claims; war

Posttraumatic stress disorder (PTSD) often occurs with other psychiatric and psychological disturbances. A recent epidemiological survey indicated that approximately 80% of individuals with PTSD met the criteria for at least one additional psychiatric diagnosis (1), such as depression, other anxiety disorders, somatization, substance abuse, borderline personality disorder, or dissociative disorder.

The greater exposure to war traumatic experience, the greater the association between war trauma and psychiatric disorders, especially those related to the war atrocities (2). However, there have been few studies on an appropriate sample of combat veterans who were not subjected to war imprisonment (3).

The evidence for comorbidity with PTSD stems from three types of research: clinical studies, veteran studies, and population surveys. Each has specific limitations, depending on the type of assessment method, focus of the research, and degree of subjective stress experienced by a patient (4).

In their comprehensive psychiatric epidemiological study of veteran psychological adjustment (the RTI – VA study), Kulka et al (5) evaluated a total of 3,016 Vietnam veterans and civilian controls. The prevalence of PTSD among veterans was 15% (21% for African-Americans, 28% for Hispanics, and 9% for women). Also, 99% of PTSD veterans reached criteria for another disorder present during the previous six months, 73% for lifetime alcohol abuse or dependence, 31% met criteria for lifetime antisocial personality disorder, 26% for lifetime major

depressive episode, 21% for lifetime dysthymia, and 10% for lifetime obsessive-compulsive disorder. In the clinical study by the Boston PTSD Center (6), 70% of the veterans had combat-related PTSD (CR-PTSD). Among them, 84% met criteria for alcohol or drug abuse, 68% for lifetime major depression, 34% for dysthymic disorder, and 26% for antisocial personality disorder. The alcohol and drug abuse, depression, and antisocial personality disorders were the most prevalent diagnoses (6).

Also, critical evaluation based on different types of investigations supports the notion that PTSD, regardless of the nature of trauma, is associated with high rates of other major psychological disorders, including substance abuse, depression, and personality disorders (4,7).

National Comorbidity Survey in USA (8) showed that most cases of lifetime major depressive disorders were secondary, in the sense that they occurred in people with prior history of another DSM-III-R disorder, whereas anxiety disorders were the most common among primary disorders. Lifetime prevalence of secondary major depressive disorder has increased, whereas the prevalence of pure and primary depression has remained unchanged (8). From the survey data, the prevalence of current (30-day) major depression was estimated at 4.9%, with relatively higher occurrence among women, young adults, and persons with less than a college education (8). The prevalence of lifetime major depression in USA was estimated at 17% (9).

Although PTSD is often comorbid with other psychological and psychiatric disturbances, especially depression, there have been few studies that investigated the vulnerability of individuals to develop PTSD and depression when exposed to combat or extreme stressors. Also, not much is known about pre-trauma, trauma, and post-trauma risk factors for the development of depression in PTSD subjects (1).

The aim of our study was to explore the psychosocial, medical, and trauma-related variables in Croatian war veterans with CR-PTSD comorbid with major depression.

Subjects and Methods

Subjects

The study comprised 402 men who underwent expert evaluation for compensation claims related to war. All were active members of the armed forces and experienced combat and war stress (median 34 years; age range, 20-60; combat experience, median 1.8 years). Also, 82% had additional traumatic experience, such as loss or death of family members, exile, wounding, and/or detention. All were treated after the war as inpatients and outpatients at different psychiatric departments all over Croatia.

The examinees had complete medical history, including data provided by their family members and significant others (friends, people in the place of work). Using a structured form, social workers collected very detailed data on veterans' previous and current psychiatric disturbances, traumatic experiences, previous and current social functioning, and sociodemographic data. The psychiatric examination aimed at determining the diagnosis of PTSD, as well as other psychiatric comorbid diagnoses.

All veterans talked first to a psychologist and then to three psychiatrists, who used structured clinical interview. The subjects were asked to describe their traumatic experiences and current and previous psychological symptoms and disturbances.

Only soldiers who met the DSM-IV criteria (10) for current and chronic PTSD were included in the comparison analysis. This group comprised 346 male Croatian veterans (from 1991-1995 war), aged

20-58 years (median 33 years). Most of the subjects had high school education (78%) and were married (73%). The duration of their combat experience ranged from 1 to 5 years (median 1.5 years) and 1 to 5 years elapsed from their active combat duty.

PTSD Diagnosis

Three independent psychiatrists based their diagnoses on structured clinical interview according to DSM-IV criteria (10), data obtained from family and significant others, and previous medical documentation (treatment, hospitalization, etc). A psychologist examined each veteran using a structured psychological interview, Mississippi combat-related posttraumatic stress disorder scale (M-CR-PTSD Scale) (12), Watson's PTSD questionnaire (12), Minnesota Multiphasic Personality Inventory-version 201 (MMPI-201) (13), and a trauma questionnaire based on the Harvard Trauma Questionnaire (14).

Watson's and Mississippi questionnaires were used to obtain quantitative psychometric data on the PTSD symptoms and to corroborate diagnosis of CR-PTSD (current and lifetime). Both scales were translated into Croatian and were shown to have good psychometric properties (15,16).

Scores on Mississippi Scale for CR-PTSD (11), Watson's PTSD Interview (12), and the Structured Clinical Interview for DSM-IV (10), including the PTSD section confirmed the diagnosis of current and chronic PTSD.

Depression Diagnosis

Diagnoses other than PTSD were based on a structured clinical interview according to DSM-IV criteria by a psychiatrist (10). The diagnosis of depression was made by a psychiatrist on the basis of a structured clinical interview according to DSM-IV criteria, previous medical documentation, and data obtained from a patient's family and significant others, and by a psychologist, who used MMPI-201 to reach the diagnosis (13). State mood and anxiety severity were rated according to the Hamilton Depression Rating Scale (HAM-D) and Hamilton Anxiety Scale (HAMA), respectively (17,18).

The final diagnosis was established when both psychiatric and psychological criteria were fulfilled. The agreement between psychiatric and psychological assessment was 0.93.

Statistical Analysis

Either chi-square or t-test were used to compare the veterans with PTSD only and veterans with PTSD comorbid with depression. Correlation between the results obtained by the M-CR-PTSD Scale, Watson's PTSD Scale, HAM-D, HAMA and clinical diagnoses was analyzed using Pearson's correlations. Statistical analysis was done in SPSS 9.0 at a significance level of $p < 0.01$.

Results

At the time of expert evaluation, 56 (14%) of the veterans did not meet the criteria for PTSD or other psychiatric disorder, although their previous psychiatric documentation showed that they had been diagnosed for such disorders. The criteria for PTSD only were met by 97 soldiers (24% of the total sample, 28% of the PTSD group), and most of them met the criteria for PTSD comorbid with another psychiatric disorder ($n=249$, 62% of the total sample, 72% of the PTSD group).

Major depressive disorder, alcohol dependence, and alcohol abuse were the most common comorbid disorders, followed by dysthymic disorder and personality disorder (Table 1). Social phobia, panic disorder, and general anxiety disorder were much less frequent. Out of 77 (31%) soldiers with major depressive disorder, 22% had suicidal thoughts, and 9% made suicide attempts.

We compared the group of veterans with PTSD only ($n=97$) with veterans with PTSD comorbid with major depression ($n=77$). There were no statistically significant differences in the age, length of employment, and sick leave between the two groups (Table 2). Also, there were

Table 1. Comorbid diagnoses in combat-experienced soldiers with post-traumatic stress disorder (PTSD)^a

PTSD comorbid with	No. (%) ^b
Major depressive disorder	77 (30.9)
Alcohol dependence + alcohol abuse	40 (16.1)
Dysthymic disorder	37 (14.9)
Personality disorder	27 (10.8)
Psychosomatic disorder	17 (6.8)
Psychotic disorder	17 (6.8)
General anxiety disorder	13 (5.2)
Drug dependence + drug abuse	8 (3.2)
Panic disorder	7 (2.8)
Social phobia	6 (2.4)
Total	249 (100.0)

^aA total of 402 war veterans with diagnosed PTSD underwent expert evaluation for compensation claims related to war suffering; out of these 249 had different psychiatric-psychological diagnoses comorbid with PTSD.

^bThe percentages do not add up because of rounding.

no significant differences in the duration of combat experience and number of traumatic experiences (Table 2).

We did categorical analysis of some psychosocial and medical variables in veterans with PTSD comorbid with major depression and those with PTSD only (Table 3). There were no statistical differences in the psychosocial variables between the two groups, but medical variables showed significant differences. We found that 35% of PTSD veterans with major depression and 6% of veterans with PTSD only had positive family history of psychiatric disease (Table 3). The soldiers who had PTSD comorbid with major depression reported major depression or alcohol dependence in the family background (mainly one of the parents or grandparents had an alcohol dependence), whereas the veterans with PTSD only reported generalized anxiety disorder or alcohol dependence in the family background. Also, 40% of PTSD soldiers with major depression and 6% of soldiers with PTSD only had previous psychiatric disturbances (Table 3). We found that 5.8% soldiers with PTSD comorbid with major depression had primary major depressive disorder before the war; others had been diagnosed with either dysthymic disorder or alcohol abuse, and 6 had been hospitalized because of generalized anxiety disorder before the war. The soldiers with PTSD only had generalized anxiety disorder, social phobic disorder, or panic disorder before the war. The veterans who had PTSD comorbid with major depression were more often psychiatrically hospitalized than subjects with PTSD only (37% vs 4.5%). In regard to medical variables, positive family history of psychiatric illness, previous psychiatric disturbances, previous episode of major depression, and psychiatric hospitalization were significantly more fre-

quent in PTSD veterans with major depression than in veterans with PTSD only (Table 3).

Correlation coefficients between psychometric psychological evaluation (M-CR-PTSD scale, Watson's PTSD scale, HAMA scale, and HAMD scale) and psychiatric evaluation using DSM-IV criteria were statistically significant, indicating their complementarity in reaching the final diagnosis (Table 4). The correlation between the psychiatric and psychological assessments on the Mississippi CR-PTSD Scale, Watson's PTSD Scale, and HAMA Rating Scale was significantly higher for the PTSD-only group than for the PTSD-depression group (Table 4). The inverse was true for the correlation of assessments on the HAMD Rating Scale (Table 4).

The scores on the HAMD Rating Scale were almost threefold higher in the group of veterans with PTSD comorbid with depression than in the PTSD only group (Table 5). The latter group had higher average scores on the HAMA Rating Scale (Table 5). The mean score on the MMPI-201 was significantly higher in the veterans with PTSD and major depression than with PTSD only (Table 5).

Discussion

Our study showed that 24% of the 402 veteran soldiers who underwent expert rediagnosis of psychiatric disturbances had the diagnosis of current PTSD only, and 62% had PTSD comorbid with some other psychiatric disorder. The most common comorbid disorder was major depression (31%), followed by alcohol dependence/abuse (16%) and dysthymic disorder (15%). These findings are very similar to those obtained on a small sample of Croatian combat-experienced soldiers performed at another psychiatric institution in Croatia (19).

We found differences in some variables between the veterans with PTSD and major depression and veterans with PTSD only. Among the veterans with comorbid PTSD and major depression, 35% had positive psychiatric family history, 40% had psychiatric disturbances before traumatic war experiences, 37% had been hospitalized before the war, and 6% had previous primary major depression. It has been shown that some diagnoses, such as depression and anxiety, may predispose a subject to psychological sequelae of trauma, whereas others, such as chronic schizophrenia, may not have an effect (20). However, the impact of major trauma, such as war, on individuals with pre-existing mental disturbances is poorly understood.

Depression and alcohol dependence/abuse were the most prevalent diagnoses in our study, similar to other studies of war veterans (7). The rates of depression, as well as the rate of other comorbid diagnoses, were higher among combat veterans with PTSD. Randomly selected

Table 2. Age, length of employment, sick leave, and trauma-related variables (median, range) of veterans with post-traumatic stress disorder (PTSD) only (n=77) or with comorbid depression (n=97)

Parameter	PTSD	PTSD+depression	Chi-square	p ^a
Age (years)	33 (20-58)	34 (20-59)	8.443	0.672
Length of employment (years)	7 (2-12)	8 (2-13)	4.321	0.562
Sick leave (months)	10 (4-16)	10 (3-17)	4.235	0.121
Duration of combat experiences (years)	1.5 (1-5)	1.5 (1-5)	1.234	0.156
Number of traumatic experiences	3 (1-6)	3 (1-7)	3.425	0.235

Table 3. Psychosocial and medical variables in soldiers with posttraumatic stress disorder (PTSD) and with (n=77) or without (n=97) comorbid depression

Category	Veterans (%) ^a		Chi-square	p
	PTSD ^a	PTSD +depression ^a		
Psychosocial variables:				
Education – high school	84.5	76.7	7.442	0.145
Marital status – married	85.2	78.4	8.123	0.176
Medical variables:				
Having positive family history of psychiatric illness	5.9	35.4	8.142	0.008
Having previous psychiatric disturbances	5.7	39.7	9.425	0.003
Having primary major depression	1.2	5.8	3.214	0.012
Having previous hospitalization	4.5	37.2	11.315	0.001

^aThe percentages do not add up because of rounding.

patients from the Boston PTSD Center met criteria for lifetime major depression in 68% and for dysthymic disorder in 34% of the cases (6). The most comprehensive psychiatric epidemiological study on veterans' psychological adjustment showed that 50% of the veterans with PTSD met criteria for another disorder during the 6 months before the study (5). They found that 99% men with PTSD reached criteria for another disorder at some previous time in their lives, 26% met criteria for a major depressive episode (lifetime), and 21% for dysthymia (lifetime) (5).

An interesting finding of our study was that 14% of the veterans did not meet any diagnostic criteria for PTSD or other diagnoses, although the diagnoses were in their medical records. This can be explained by either successful treatment or misdiagnosis of PTSD. PTSD is commonly misdiagnosed for some other mental disorder, which results in inappropriate treatment (22). The diagnostic assessment is more difficult in the situation of expertise, such as those for disability compensation, because of possible factitious disorder or malingering. To reach the most objective diagnosis and appropriate therapy, it is necessary to include many different assessment methods, both psychiatric and psychological as well as diagnostic criteria specific to PTSD and comorbid disorders (23,24). Interviewing patients about their previous psychiatric disturbances, pre-traumatic and traumatic experiences, and posttraumatic functioning can help in distinguishing PTSD from other mental disorders. The data obtained from family and significant others about the nature of the current symptoms and previous and current social functioning are also very important. However, ordinary forensic methods that are often effective in identifying malingerers, such as repeated, rapid questioning, identification of contradictions, and presence of extreme or rare symptomatology, become less useful when dealing with PTSD, because the traumatic experience is often difficult for the survivor to recall (23,24).

Veterans with comorbid PTSD and major depression had higher average score of depressive symptoms on the Hamilton Depression Rating Scale. When specific measuring instruments for depression, such as Hamilton Depression Rating Scale, are used, high rates of depressive symptoms can be observed in traumatized persons (25). For example, our study on displaced persons and refugees from Croatia and Bosnia and Herzegovina showed that only 10% had no depressive symptoms (25).

In other studies, where more assessments methods and measuring instruments were used for obtaining the final diagnosis, the comorbidity rate of the PTSD and depression was lower (19,25,26).

Persons with CR-PTSD commonly show elevations on MMPI clinical scales (27). Profile 2-8 or 8-2 is frequently seen, reflecting patient's depression or alienation from his or her own painful images and emotions, which are reluctantly communicated (28). Also, MMPI offers more promise in detecting persons who exaggerate their symptoms. MMPI is the most validated psychological test to obtain information on functioning, as well as on certain malingered mental illness (29). Where possible, expert evidence should include the use of the MMPI and other methods of evaluations in addition to the clinical interview.

Table 4. Correlation of psychological and psychiatric assessments of veterans with of posttraumatic stress disorder (PTSD) and with (n=77) or without (n=97) comorbid depression

Psychological assessment	Psychiatric assessment	
	PTSD ^a	PTSD+depression ^a
Mississippi combat related PTSD scale	0.85	0.72
Watson's PTSD scale	0.66	0.57
Hamilton Anxiety Scale	0.48	0.28
Hamilton Depression Scale	0.22	0.66

^ap<0.01 for all comparisons.

Table 5. Average score of veterans with posttraumatic stress disorder (PTSD) comorbid with depression (n=77) and PTSD only (n=97) on the Hamilton Depression Rating Scale (HAMD), Hamilton Anxiety Scale (HAMA), and Minnesota Multiphasic Personality Inventory-version 201 (MMPI-201)

Instrument	Score (mean SD)		
	PTSD only	PTSD + depression	p ^a
HAMD	8.1±1.1	24.5±2.3	0.001
HAMA	15.3 2.3	10.1 2.5	0.002
MMPI-201	32.1 11.4	58.1 12.3	0.003

^aStudent t-test.

The veterans with PTSD and depression showed deviations on the MMPI-201 scale of depression. The deviations may be the result of a partial overlap of PTSD symptoms and depression (lost of interest, insomnia, loss of will-power, etc). In our study, depression obtained by MMPI was more pronounced in the subjects with PTSD and depression symptoms than in persons with PTSD symptoms only. Also, the mean score of the MMPI-201 scale was higher in the group of subjects with comorbid PTSD and depression than in the PTSD-only group.

Since the elapsed time between the traumatic experiences and expert examination was 1 to 5 years in most our cases, in some subjects we measured symptoms of chronic PTSD. Time is important in the clinical presentation of psychiatric symptoms in traumatized persons. In our study of Croatian combat experienced soldiers and prisoners of war, combat-experienced soldiers with symptoms of acute PTSD complained of panic attacks and reported uncontrolled aggressive behavior more often, whereas depressive reactions were more often reported by prisoners of war with chronic PTSD symptoms (16).

The severity of exposure to trauma, age at capture, and post-military social support had a moderate predictive value for diagnosis of PTSD and only a weak predictive value for other disorders in one long-term study of traumatic experiences of prisoners of war (30). The number of traumatic experiences and the duration of traumatic exposure also had a weak predictive value (30). In our study, we did not find differences between veterans with comorbid PTSD and depression and veterans with PTSD only with respect to the duration of combat experiences and the number of traumatic experiences. All of them had combat experience, followed by displacement, capture, torture in detention camps, and/or loss of family members.

It would be interesting to follow-up this group of combat veterans regarding the comorbidity, because some investigations showed that rates for comorbid substance abuse disorders, PTSD, schizophrenia, and personality disorder peaked in younger veterans and then decreased with age (31). Major depression, anxiety disorders, and organic brain syndrome or dementia were observed to increase with age (31).

In conclusion, our study showed that pre-traumatic factors, such as positive psychiatric family history and pre-existing mental disturbances before combat experience, may predispose depression as comorbid diagnosis in soldiers with PTSD. Our study also confirms the need to use different assessment methods in establishing the final diagnoses in the situation of treatment and expert evaluation for compensation-related purposes. The same holds true for army drafting, where numerous difficulties and questions burden the combat ability assessment procedure, especially in wartime circumstances. In spite of technical development in modern warfare, there is a constant need for manpower in armed forces. The smaller the country, the more urgent the need, as it was in Croatia. In assessing combat ability, a special attention should be paid to candidate's psychiatric history, because it has been shown that frequent mistakes made during mass mobilizations may lead to major absenteeism on psychiatric grounds (32). Also, disability compensation is often

questionable for subjects who had already been under psychiatric treatment before the war. All this proves that combat ability assessment is by no means a simple procedure, and use of adequate measuring instruments by trained team of professionals is obligatory.

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