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## PREVENTION OF DEMENTIA FORMATION IN RETIRED COMBAT PARTICIPANTS WITH A HISTORY OF TRAUMATIC BRAIN INJURY

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**Background:** A set of measures to prevent the formation of gross organic mental disorders in combat participants having traumatic brain injury (TBI) is an important public health task. This study aims to conduct a catamnestic survey of retired combat participants who possess a history of TBI to determine the directions of prevention of dementia formation.

**Methods:** Seventy-one retired combatants were surveyed at the time of their retirement and three years after their retirement. Clinical and experimental psychological methods were used. To identify the dynamics of cognitive disorders, the Short Sample Test was used (in the adaptation of Vanderlick), and Kotenev's Questionnaire of Traumatic Stress was used for post-stress disorders -. The catamnestic method was applied via the study of outpatient cards and using a social survey of retired combatants three years after their dismissal.

**Results:** It was found that 47.8% of participants in combat operations had neurosis-like disorders with impaired emotions, 26.8% - organic emotional-labile disorder, 25.4% - organic personality disorder, 26.7% - alcohol abuse, and 25.4% were disabled due to mental illness. Three years after their dismissal, their cognitive abilities had a significant negative dynamic with a marked decrease in the integral indicator of intellectual activity; emotional disorders, and signs of psychosocial mal-adaptation were detected.

**Conclusion:** A catamnestic analysis of the mental health of participants in combat operations with traumatic brain injury in their history showed the presence of adverse psychosocial trends, a fact that requires the development of measures to improve the effectiveness of complex inter-professional therapy and rehabilitation. To prevent the formation of deep mental disorders with severe cognitive impairment and dementia, it is necessary to develop and improve the regulatory legal and information base for organizing psychiatric care.

**Keywords:** retired combatants; traumatic brain injuries; organic mental disorders; dementia prevention

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## 1. Introduction

In terms of natural annual population decline and low life expectancy for men in Russia, and considering the constant growth in the number of armed conflicts in the world, a set of measures for the prevention of coarse organic mental disorder formations in combatants with traumatic brain injury (TBI) is an important healthcare task and is considered to be an emergency medicine in the framework of interdisciplinary areas of scientific and practical research (GUZOVA et al. 2010).

The prevalence of traumatic brain injury in the world per 1000 people varies from country to country; it is 7.3% in China, 5.3% in the US, 4.0% in Russia, and 1.1% in Scotland (SABIROV et al. 2017; ROSSTALNAYA 2017). Every year in the United States, 1.6 million people suffer TBI: 51 thousand of them die, and 124 thousand become disabled (PEETERS et al. 2015).

In the Russian Federation more than 120 thousand people became disabled due to fighting and war injuries; of those who need state support measures among the examined veterans, the war in Afghanistan produced a head injury count of 53%, and in the antiterrorist operation on the territory of the Chechen Republic, this number was as high as 56% (TROSHIN et al. 2011).

Participants in local wars and armed conflicts are a specific contingent that requires multi-disciplinary therapy with subsequent rehabilitation, and disabled people from among them can be allocated to a group of special social significance, since among veterans recognized as disabled for the first time, more than 50% (in some regions - up to 70%) are persons of working age (BOYKO et al. 2015). The analysis of the age structure pertaining to retired combatants who performed operational and service tasks in special conditions shows that these are mainly people aged 46 to 48 years (KARAYANI & KARAYANI 2014).

Even in the presence of severe mental disorders and significant social maladaptation, participants in combat operations often do not realize the need for treatment and rarely seek specialized help (GUZOVA et al. 2010). They tend to hide the disease's symptoms, and ignore the recommendations for examination and treatment; they see the need for help as a sign of weakness, and the offer of therapy as an insult. If untimely assistance is provided, personal disorders occur that disrupt social functioning and lead to disability of these retired combatants, followed by social decline up to the development of a dementia state (SOLOVIEV et al. 2017).

This study aims to conduct a catamnestic survey of retired combat participants who have a history of TBI in order to determine the directions for preventing dementia formation.

## **2. Materials and methods**

### **2.1 Selection of study participants**

We selected patients from among retired combatants who had at the time of dismissal a long service that entitled them to a pension.

### **2.2 Study design**

This is a prospective study. The combatants were monitored when leaving the service and then again after three years.

### **2.3 Sample size**

This is a catamnestic survey of 71 participants in combat operations who passed the military medical examination when retiring from the Russian power structure in the period from 2015 to 2018, with a closed TBI of mine-explosive etiology in the anamnesis, their average age being  $44.3 \pm 3.4$  years, who had a long service at the time of retirement, giving them the right to a pension.

### **2.4 Variable used and study tools**

Clinical and experimental psychological methods were used when leaving the service and then again after three years. To identify the dynamics of cognitive disorders, the Short Selection Test was used (in the adaptation of Vanderlick) (BURLACHUK & MOROZOV 2002), and Kotenev's Questionnaire of Traumatic Stress was utilized to identify post-stress disorders' symptoms (BURLACHUK & MOROZOV 2002). The catamnestic method was applied via the study of outpatient charts and the use of social surveys of these ex-combatants three years after their discharge.

### **2.5 Research ethics**

All participants were clearly explained the study's goals and methods, and they signed a consent form for participation in the study. They were told about the right to stop participating in the study without explanation. All received information is encrypted and kept secret.

### **2.6 Data analyses**

The statistical processing of research results was carried out using the program SPSS 22.0, using the Mann-Whitney test [data presented as medians (Me) and first and third quartiles (Q1-Q3)] level of statistical significance  $p < 0.001$ .

### 3. Research results

The catamnestic analysis of the combatants' mental health showed that out of 71 people with TBI, 34 (47.8%) had neurosis-like disorders with impaired emotions, manifesting in the form of irritability, irascibility, and conflict; 19 (26.8%) suffered from organic emotional-labile disorder; and 18 (25.4%) were diagnosed with organic personality disorder.

When analyzing the cognitive abilities indicators of combatants during retirement, all results based on the Short Selection Test corresponded to the average limit of the age norm. Three years after the dismissal, these parameters had a significant negative dynamic with a marked decrease in the integral indicator of intellectual activity, there was a significant decrease in the ability to generalize and analyze information, which decreased the efficiency of spatial thinking, stability of mental activity, flexibility of thought processes and attention. This reflects the trend of increasing cognitive impairment in retired combatants having a history of TBI (*Table 1*).

*Table 1*  
Features of cognitive functions in retired combatants having a history of TBI,  
Short Selection Test, Me (Q1-Q3), points

<i>Scales</i>	<i>Retired combatants with TBI, Me (Q1-Q3)</i>		<i>p</i>
	<i>At the time of dismissal</i>	<i>After three years</i>	
<i>Integral indicator</i>	19.0 (12-21)	16.0 (11-13)	<0.001
<i>Ability to analyze and summarize information</i>	3.0 (2-5)	2.0 (1-3)	<0.001
<i>Spatial thinking</i>	4.0 (2-6)	2.0 (1-3)	<0.001
<i>Stability of mental activity</i>	4.0 (2-6)	2.0 (1-3)	<0.001
<i>Flexibility of thought processes</i>	5.0 (2-6)	2.0 (1-3)	<0.001
<i>Attention</i>	5.0 (2-6)	3.0 (1-4)	<0.001

Note: *p* - was calculated using the Mann-Whitney test; the level of statistical significance  $p < 0.001$ .

The survey of respondents using Kotenev's Questionnaire revealed sufficient frankness and a tendency to an increased fixation on the state of health when retiring for seniority. The dissimulation of symptoms for post-traumatic stress disorder (PTSD) was not determined in them, and they did not associate their condition with the impact of combat stress. No significant differences existed in the scales indicating the presence of intrusion symptoms and avoidance of psycho-traumatic events. The respondents were characterized by symptoms of hyperactivity and had a high final indicator of the presence of PTSD symptoms. The scale of 'distress and maladaptation' reflected a sufficient level of adaptation to peaceful life. The test results indicated the formation of a neurotic state not associated with PTSD.

Three years after they were dismissed, pensioners had less frankness in the survey, a significant decrease in aggressiveness, and they were less focused on their health problems. A dissimulation of the state was observed with significantly higher indicators on the 'distress and maladaptation' scale. Their final scores for PTSD symptoms were significantly lower (*Table 2*), which probably indicates an increase in signs of psychosocial maladaptation against the background of cognitive and emotional disorders and is associated with the progression of the disease. In addition, 93.2% of the surveyed respondents had subjective cognitive disorders, represented by complaints of memory impairment, distraction, and difficulties in learning new skills. They noted that these symptoms reduce their domestic and social activities and make their daily life difficult. In 87% of the cases, the need for frequent use of sedatives was identified due to the presence of emotional problems of a neurotic nature.

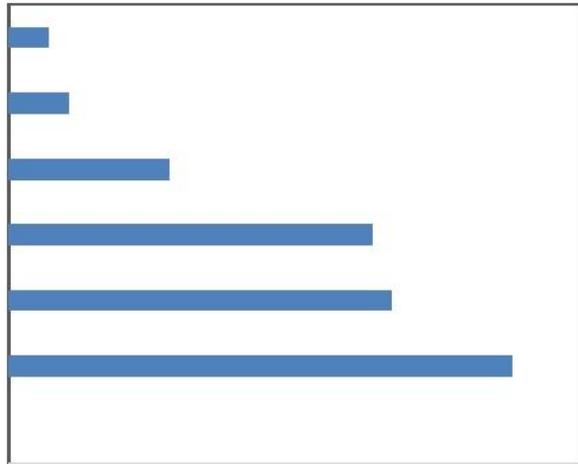
*Table 2*

Frequency of occurrence of PTSD signs in retired combatants with a history of TBI, Kotenev's Questionnaire of Traumatic Stress, Me (Q1-Q3) points

<i>Scales</i>	<i>Retired combatants with TBI, Me (Q1-Q3)</i>		<i>p</i>
	<i>At the time of dismissal</i>	<i>After three years</i>	
<i>Lie</i>	52.0 (29.0-56.0)	55.0 (42.0-59.0)	<0.001
<i>Aggravation</i>	55.0 (41.0-59.0)	48.0 (35.0-57.0)	<0.001
<i>Dissimulation</i>	45.0 (35.0-56.0)	20.5 (9.0-48.0)	<0.001
<i>The event of injury</i>	10.0 (6.0-14.0)	23.0 (12.0-34.0)	<0.001
<i>Symptoms of intrusion</i>	27.0 (22.0-34.0)	27.0 (22.5-35.0)	0.123
<i>Symptoms of avoidance</i>	27.0 (23.0-35.0)	28.0 (22.0-35.0)	0.214
<i>Symptoms of hyperactivity</i>	34.0 (26.0-40.0)	21.0 (12.0-33.0)	<0.001
<i>Distress and maladaptation</i>	14.0 (11.0-24.0)	24.0 (12.0-72.0)	<0.001
<i>Signs of PTSD</i>	85.0 (23.0-111.0)	68.0 (51.5-89.5)	<0.001

Note: *p* - was calculated using the Mann-Whitney test; the level of statistical significance  $p < 0.001$ .

When analyzing social indicators, it was found that 42 people (59.1%) were not employed; only 25 (35.2%) of respondents received psychiatric care, which is due to both an insufficient criticism of the disease and difficulties when applying to polyclinics at the place of residence. Furthermore, 19 (26.7%) abused alcohol, including 4.2 % who were diagnosed with alcoholism; 18 (25.4 %) were disabled due to mental illness; two of the veterans (2.8%) had tried to commit suicide (*Figure 1*).



*Figure 1*  
Social indicators of retired combatants, %

Implementing the therapy and rehabilitation of participants in combat operations with the consequences of TBI is significantly more difficult than for civilians, due to the presence of 'combatant accentuation', with the presence of short temper, irritability, discommunicativeness, as well as distrust of doctors and psychologists. When conducting their treatment measures, these patient characteristics should be taken into account, which often lead to conflicts and the refusal to conduct therapy. Preventing further cognitive disorders and slowing down the formation of dementia states are the main objectives of the treatment process. For an adequate correction of the existing mental disorder, it is necessary to apply both pharmacological and non-medicinal methods of therapy and comprehensive rehabilitation, including its social component.

In this regard, during the social and psychological rehabilitation of retired military participants, special attention should be paid to the development of human labor potential, which will help them to re-understand the post-traumatic experience they have endured, find new life prospects and values. An important aspect of social rehabilitation of this contingent is a participation in veterans' rehabilitation programs and public organizations offering a solution to such problems experienced by war participants as: the social protection of retired combatants, participation in patriotic education of young people, the mentoring of young employees in law enforcement agencies. For retired combatants, participating in social projects increases their employment and authority, which thereby reduces social maladjustment and improves their quality of life.

#### 4. Conclusions

The catamnestic analysis of participants' mental health in combat operations with TBI in their history showed the presence of adverse psychosocial trends, which requires the development of measures to improve the effectiveness of complex poly-professional therapy and rehabilitation. To prevent the formation of deep mental disorders possessing severe cognitive impairment, it is necessary to develop and improve the regulatory legal and information base for organizing psychiatric care. This will not only enhance the quality of mental disorders diagnoses, but also improve the treatment of psycho-pathological disorders, reduce the patients' stigmatized attitudes toward the psychiatric service, and systematize areas of work to prevent the development of dementia. A need exists for a system of comprehensive medical and social protection measures that stimulate reserves for improving the mental health of retired combatants in order to create conditions for their self-realization and the possibility of a more active participation in public life.

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