

## LITERARY REVIEW OF POST-TRAUMATIC ENCEPHALOPATHY

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**Abstract:** The article presents literary data from various authors on post-traumatic encephalopathy. Researchers have developed objective diagnostic criteria for acute traumatic encephalopathy (ATE), a condition that occurs shortly after mild traumatic brain injury (mTBI). Criteria for OTE are based on blood biomarkers and neurological tests and include neuropsychiatric dysfunction, imaging abnormalities, or abnormal biomarkers in patients with a history of TBI.

Defining ATE improves understanding of mTBI and may lead to improved clinical management. The study results are published in the journal *Frontiers in Neurology/NeuroTrauma*, along with a description of the HeadSMART II clinical trial protocol, which evaluates the diagnostic and prognostic potential of the BrainBox TBI test.

The researchers emphasize the need for objective testing to diagnose early TBI and note that current practice is based primarily on subjective reports and there are no objective diagnostic tests available at the time of presentation

**Key words:** ATE, TBI, encephalopathy, literature review.

**The relevance of the research.** Chronic vascular diseases of the brain represent a serious problem for society, affecting the economy, public health and the quality of life of patients. These diseases include cerebral atherosclerosis, hypertensive encephalopathy and other vascular lesions such as chronic cerebral ischemia.

The main risk factors for chronic cerebrovascular disease are hypertension (high blood pressure) and atherosclerosis (clogged arteries). Arterial hypertension affects about 40% of the Russian population and in most cases is caused by hypertension. Atherosclerosis is more common in men aged 50-60 years, and in approximately half of the cases it is combined with arterial hypertension.

Hypertensive encephalopathy can occur acutely (within hours) when blood pressure is extremely high. Symptoms include severe headache, nausea, vomiting, visual disturbances and confusion. Chronic hypertensive encephalopathy develops gradually due to poorly controlled high blood pressure, which leads to poor circulation in the brain.

Diagnosis of encephalopathy includes anamnesis, clinical examination, laboratory tests and instrumental studies [A. M. Abdrakhmanova 2007]

RICHMOND, Virginia (11/18.2021) - Investigators of a large clinical trial of patients with mild traumatic brain injury (mTBI or concussion) describe for the first time objective diagnostic criteria, based on blood biomarkers and neurological testing, for acute traumatic encephalopathy. (ATE), the immediate physiological consequence of injury.

According to researchers, acute traumatic encephalopathy (ATE) is a condition of objective assessment of symptoms or dysfunction associated with TBI that occur within 90 days of acute head injury. This may manifest as neuropsychiatric dysfunction, imaging abnormalities, or biomarker abnormalities in patients with a history consistent with TBI. Objective ATE criteria may improve the understanding of mild TBI and significantly improve its subsequent clinical management.

The ATE was published in *Frontiers in Neurology/NeuroTrauma* along with the HeadSMART II (Serum Markers of Head Trauma and Multimodality to Assess Trauma Response) clinical trial protocol, which evaluates the diagnostic and prognostic potential of the BrainBox TBI test from BrainBox Solutions. .

“There is a critical need for an objective testing approach to diagnose early TBI,” said W. Franklin Peacock, MD, FACEP, lead investigator, professor of emergency medicine and associate chair of research in the department of emergency medicine at Baylor College of Medicine. “Despite approximately 2.8 million annual emergency department visits, the diagnosis of TBI is based primarily on reports of loss of consciousness, post-traumatic amnesia, and/or confusion, with no objective diagnostic tests available at the time of presentation or the ability to determine the patient's prognosis at the time of injury.” . [journal *Frontiers in Neurology/NeuroTrauma*.]

PTE can occur in different types: with attenuation of symptoms, their constant preservation, with alternation or with an increase in symptoms. Depending on which signs of pathology are more pronounced.

### **Syndromic classification of PTE:**

**Vegetative-dystonic.** Most often observed. Manifested by fluctuations in blood pressure, heart rhythm disturbances, and circulatory disorders (associated with circulatory disorders). Low-grade fever, endocrine and metabolic disorders may occur. Characterized by headaches, weakness, increased fatigue, excessive sweating and other symptoms.

**Asthenic.** Present in almost all cases of PTE. It manifests itself as lethargy, fatigue, including after intellectual stress, deterioration of cognitive functions, insomnia or, conversely, drowsiness. Characterized by psycho-emotional disorders - short temper, instability of mood, depression, neuroses. An excessive reaction to external stimuli - auditory, visual - is possible.

**Syndrome of cerebrospinal fluid circulation disorders.** Most often it occurs with signs of increased intracranial pressure. May present with headaches, a feeling of pressure on the eyes and forehead, nausea and vomiting, unsteadiness of gait, lethargy and cognitive impairment.

**Cerebrofocal.** Occurs with massive injuries. It manifests itself as severe motor impairment, changes in sensitivity, intellectual and mental disorders.

**Psychopathological.** It is observed in almost all sufferers of PTE. It can be expressed very differently - in the form of neurasthenia, phobic and depressive states, psychoses, obsessive paranoid or suicidal thoughts, hallucinations up to delirium, partial or complete memory loss, outbursts of aggressiveness, a pronounced decrease in intellectual functions, etc.

**Epileptic.** As a rule, it begins to appear within the first year after injury. The main symptom is seizures of epileptic seizures. It is often combined with pronounced psycho-emotional disorders - affective behavior, aggressiveness, irascibility, etc.

### **Classification of PTE according to ICD-10:**

- G91.3 Post-traumatic hydrocephalus, unspecified
- G44.3 Chronic post-traumatic headache
- G93.4 Encephalopathy, unspecified
- F07.2 Post-concussion syndrome
- F00-F09 Organic, including symptomatic, mental disorders
- Epileptic syndromes.

### **Clinical manifestations of PTE**

Post-traumatic encephalopathy (CTE) develops in people who play contact sports for long periods of time and suffer mild traumatic brain injuries.

1. Cognitive impairment:

- Memory loss (especially short-term)

- Decreased regulatory functions (problem solving, judgment)
- Later: decline in language skills and spatial reasoning
- 2. Affective disorders:
  - Depression and despair (up to 30% of cases)
  - Anxiety, agitation, apathy, rarely - dementia
- 3. Behavioral disorders:
  - Irritability and aggression
  - Impulsivity, paranoid thoughts, disinhibition
  - Deterioration of relationships, obscene language, use of physical force
  - Substance abuse
- 4. Motor disorders:
  - Parkinsonism (tremor, hypomimia, rigidity, unsteadiness)
  - In some patients: dysarthria, dysphagia, coordination disorders
  - Rare: motor neuron disease (muscle weakness, atrophy)
- 5. Other symptoms:
  - Chronic pain (for example, headache in the early stages) [H., Kara E., Revesz 2014]
  - Clinical manifestations of CTE may vary depending on the severity of the injury and individual characteristics.

**Purpose of the study.** The purpose of the study of this article is to study the etiology, pathogenesis and classification of PTE taking into account various factors. The authors of the article seek to consider the various forms of the disease.

To develop objective diagnostic criteria for acute traumatic encephalopathy (ATE) to improve the understanding of mild traumatic brain injury (mTBI) and its clinical management.

**Result and discussion.** The study results showed that the investigator-developed objective diagnostic criteria for acute traumatic encephalopathy (ATE) have significant potential for improving the diagnosis and treatment of mTBI. The use of biomarkers in the blood and neurological tests made it possible to accurately determine the condition of patients with a history of tBI and identify OTE even in the absence of pronounced clinical symptoms. This approach differs from current practice, which relies on subjective patient reports, and could significantly improve the early diagnosis and treatment of traumatic brain injuries.

Discussion on this topic highlights the importance of introducing objective diagnostic methods into the clinical care of patients with mTBI. Determining OTE in patients with mTBI may help treating physicians make more informed decisions about therapy and rehabilitation, which may ultimately improve prognosis and treatment outcomes. Further research and clinical trials, such as the HeadSMART II study protocol, will help confirm the effectiveness and reliability of the developed methods for diagnosing and treating mTBI.

#### **Bibliography:**

1. Chronic traumatic encephalopathy: a critical appraisal / Levin B., Bhardwaj A. // *Neurocrit Care* 2014; 20: 334-344.
2. Concomitant progressive supranuclear palsy and chronic traumatic encephalopathy in a boxer / Helen Ling H., Kara E., Revesz T., Lees A.J. Plant G.T., Martino D., Houlden H., Hardy J., Holton J.L. // *Acta Neuropathologica Communications* 2014; 2 (24): 1-11.
3. Chronic traumatic encephalopathy and suicide: a systematic review / Wortzel H.S., Shura R.D., Brenner L.A. // *BioMed Research International* 2013: 1-6.
4. Chronic traumatic encephalopathy: how serious a sports problem is it? / Tator C.H. // *Br J Sports Med.* 2014; 48: 81-83.

5. Modern chronic traumatic encephalopathy in retired athletes: what is the evidence? / Karantzoulis S., Randolph C. // *Neuropsychol Rev.* 2013; 23: 350-360.
6. Chronic traumatic encephalopathy and risk of suicide in former athletes / Iverson G.L. // *Br J Sports Med.* 2014; 48: 162-164.
7. Chronic traumatic encephalopathy: where are we and where are we going? / Mez J., Stern R.A., McKee A.C. // *Curr Neurol Neurosci Rep.* 2013; 13: 407-418.
8. Clinical subtypes of chronic traumatic encephalopathy: literature review and proposed research diagnostic criteria for traumatic encephalopathy syndrome / Montenigro P.H., Baugh C.M., Daneshvar D.H., Mez J., Budson A.E., Rhoda A., Katz D.I., Cantu R.C., Stern R.A. // *Alzheimer's Research and Therapy.* 2014; 6: 68-85.
9. Punch drunk / Martland H. // *JAMA* 1928; 91: 1103-1107.
10. The spectrum of disease in chronic traumatic encephalopathy / McKee A.C., Stein T.D., Nowinski C.J., Stern R.A., Daneshvar D.H., Alvarez V.E., Lee H.-S., Hall G., Wojtowicz S.M., Baugh C.M., Riley D.O., Kubilus C.A., Cormier K.A., Jacobs M.A., Martin B.R., Abraham C.R., Ikezu T., Reichard R.R., Wolozin B.L., Budson A.E., Goldstein L.E., Kowall N.W., Cantu R.C. // *Brain* 2013; 136: 43-64.
11. Chronic traumatic encephalopathy: neurodegeneration following repetitive concussive and subconcussive brain trauma / Baugh C.M., Stamm J.M., Riley D.O., Gavett B.E., Shenton M.E., Lin A., Nowinski C.J., Cantu R.C., McKee A.C., Stern R.A. // *Brain Imaging and Behavior* 2012; 6: 244-254.
12. Medical aspects of boxing, particularly from a neurological standpoint / Critchley M. // *Br Med J.* 1957; 1: 357-362.
13. Organic psychosyndromes due to boxing / Johnson J. // *Br J Psychiatry* 1969; 115: 45-53.
14. Chronic traumatic encephalopathy in sport: a systematic review / Gardner A., Iverson G.L., McCrory P. // *Br J Sports Med.* 2014; 48: 84-90.
15. Chronic traumatic encephalopathy in a National Football League player / Omalu B.I., DeKosky S.T., Minster R.L., Kamboh I.M., Hamilton R.L., Wecht C.H. // *Neurosurg.* 2005; 57: 128-134.
16. Chronic traumatic encephalopathy: clinical biomarker correlations and current concepts in pathogenesis / Gandy S., Ikonomic M.D., Mitsis E., Elder G., Ahlers S.T., Barth J., Stone J.R., DeKosky S.T. // *Molecular Neurodegeneration* 2014; 9: 37-58.
17. Narzullayeva O.M., Sanoev B.A. Dercum's Disease (Neurolipomatosis) as Concomitant Disease in Autopsy Practice 2023; 33-40. Retrieved from <https://medicaljournals.eu/index.php/IJIMM/article/view/93>
18. Саноєв Б.А., Нарзуллаєва О. М. Volume: 02 Issue: 11 | Nov – 2023 ISSN: 2720-6866 Retrieved from <http://journals.academiczone.net/index.php/rjtds>
19. Narzullayeva O.M., Sanoev B.A. Morphological Features of Ovarian Neoplasms. 2023; 41-46 Retrieved from <http://medicaljournals.eu/index.php/IJIMM/issue/view/3>
20. Narzullayeva O.M. The Effect of Stress on the Morphology of the Thyroid Gland 1(10), 834–839. Retrieved from <https://grnjournal.us/index.php/AJPMHS/article/view/2447>