



## THERAPEUTIC FEATURES OF CHRONIC CEPHALGIA FORMED AS A CONSEQUENCE OF TRAUMATIC BRAIN INJURY

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### Abstract

The article reflects the issues of etiopathogenesis of post-traumatic pain, examines its place in the modern classification of this cephalgia, and highlights the algorithm for its diagnosis and treatment. It has been established that persistent post-traumatic cephalgia, unlike other headaches, is diagnosed by the duration of its persistence after a traumatic brain injury. The leading factors in the pathogenesis of this headache are psychopathological changes and excessive use of analgesics. Effective treatment of chronic post-traumatic cephalgia should include measures to prevent the development of drug-dependent headaches and preventive therapy using antidepressants.

**Keywords:** chronic post-traumatic headache; persistent headache associated with traumatic head injury; headache.

### INTRODUCTION

Persistent post-traumatic headache (ICD 10 code - G44.3) is a secondary cephalgia that is caused by traumatic brain injury and persists for more than 3 months [1].

Headaches are a common complication of traumatic brain injury and are observed in 30–90% of patients with head and/or neck injuries. In 32–44% of victims, post-traumatic cephalgia is chronic and persists for at least 6 months, and in 25% of them - 4 or more years [2].

### MATERIALS AND METHODS

According to ICHD-3, there are two types of persistent headache associated with traumatic head injury:

- persistent headache associated with moderate or severe traumatic head injury;
- persistent headache associated with mild traumatic head injury [3].

Post-traumatic headache develops as a result of traumatic brain injury, which is mechanical damage to the skull and intracranial formations (brain, meninges, vessels, cranial nerves) due to external influences, such as blows to the head any objects or hitting the head against them, penetration of the head by foreign bodies, exposure to shock waves of various origins, general shaking of the body, for example, when falling





from a height. The variety of external influences, however, allows us to identify groups of primary factors that are the direct causes of mechanical head trauma: direct contact destruction of the structures of the skull and intracranial formations, hydrodynamic shock, shock wave and impact effect of the bone-cranial deformations [4].

## RESULTS AND DISCUSSION

Psychopathological disorders are caused by physical and emotional stress observed in any traumatic brain injury. They are manifested by post-traumatic insomnia, disturbances in emotional motivation and mood swings, for example, due to the patient's concern about the possibility of recovery and restoration of professional skills. Sometimes the social and legal aspects of traumatic brain injury are important: litigation, the desire to receive financial insurance compensation [5]. Psychopathological disorders directly depend on the genetic predisposition and personal characteristics of the patient, his premorbid characteristics, and social status. Persistent post-traumatic headache more often develops in women, in people with a low intellectual, educational and socio-economic level, alcohol abusers, and those with concomitant mental disorders or cephalgia before the injury. Old age is not an unfavorable prognostic factor for the development of chronic post-traumatic cephalgia [2].

The commonality of individual links in the pathogenesis of chronic post-traumatic headache and primary cephalgia (migraine, tension headache) was discovered: metabolic disorders of excitatory amino acids, neuropeptides, serotonin, catecholamine, endogenous opiates, magnesium in brain tissue; decrease in the excitation threshold (sensitization) of cells of the trigeminal nerve nuclei and cortical neurons [3].

The irrational use of analgesics may be of great importance for the pathogenesis of chronic post-traumatic headache. Failure to comply with their dosage regimen contributes to the long-term persistence of cephalgia after injury through the development of headache associated with excessive drug intake [4].

After a traumatic brain injury, chronic post-traumatic headache can be the only symptom or observed in combination with other clinical manifestations: dizziness, asthenia, insomnia, anxiety, personality changes, irritability, decreased memory, concentration, psychomotor activity. There are no specific clinical characteristics for chronic post-traumatic headache. In approximately 80% of patients, chronic post-traumatic cephalgia resembles a tension headache. About 20% of patients, especially those with a relevant family history (relatives with migraine), report the development of a migraine-like headache without aura. In rare cases, chronic post-traumatic



cephalgia may have signs of cluster headache, neuralgia of the superciliary or occipital nerves, headache during physical exertion or during sexual activity.

The diagnostic criteria used in ICHD-3 take into account not the clinical characteristics of chronic post-traumatic headache, but its temporal relationship with traumatic brain injury and duration [2]. Diagnostic criteria for persistent headache associated with traumatic injury denting the head:

- A. Any headache that meets criteria C and D.
- B. Verified diagnosis of traumatic brain injury.
- C. The patient complains of a headache within 7 days after one of the following events:
  - 1. traumatic brain injury;
  - 2. restoration of consciousness after traumatic brain injury;
  - 3. stopping medications (c) that reduce the ability to feel or report headaches after traumatic brain injury;
- D. Headache persists for more than 3 months after traumatic brain injury.
- E. There is no better correspondence to another diagnosis according to ICHD-3.

Diagnostic criteria for persistent headache associated with moderate to severe head trauma:

- A. Headache meeting the criteria for persistent headache associated with traumatic head injury.
- B. Traumatic brain injury having at least one of the following characteristics:
  - 1. loss of consciousness for more than 30 minutes;
  - 2. Glasgow Coma Scale (GCS) score - less than 13 points;
  - 3. post-traumatic amnesia for more than 24 hours;
  - 4. change in level of consciousness for more than 24 hours;
  - 5. neuroimaging signs of traumatic head injury (intracranial hemorrhage and/or brain contusion).

Certain difficulties in differential diagnosis arise in situations where a patient with an existing headache receives a traumatic brain injury. Then the following algorithm is applied: if an existing cephalalgia with the characteristics of a primary disorder becomes chronic or becomes significantly more severe, which means an increase in the frequency and/or severity of the headache by two or more times, the headache is recognized as post-traumatic, and if its duration is more than three months – chronic [4].

Chronic post-traumatic headache is heterogeneous in its clinical manifestations. In general, the treatment strategy is determined by the similarity of the symptoms of this cephalalgia with certain forms of primary headaches. Nonsteroidal anti-inflammatory drugs are used to relieve attacks of cephalalgia that resemble tension headaches.



Patients with migraine-like attacks, in the absence of contraindications, are prescribed ergotes or triptans [5].

## CONCLUSION

Correct treatment of persistent post-traumatic headache makes it possible in most cases to stop it within four years after the injury. At the same time, in approximately 25% of patients, due to a number of objective and subjective reasons, the treatment of these cephalgia is ineffective, and constitutes a major medical and social problem.

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