



Comprehensive Diagnosis of Patients with Post-Traumatic Epilepsy

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Abstract: Among the many etiological factors of epilepsy, a special role is assigned to craniocerebral trauma (CMT). The roots of the history of the first described attack of epilepsy against the background of a traumatic brain injury go back to the time of Hippocrates. In modern medicine, according to the international classification of epilepsy (ELAE, 1989), post-traumatic epilepsy refers to locally conditioned symptomatic epilepsy, the setting of the diagnosis (PTE), is established in the presence of two signs. In addition, the diagnosis is established in the presence of an organic brain lesion. The nature of PTE formation is influenced by the severity of the traumatic event and the duration of the post-traumatic period. Thus, according to many authors, epileptic seizures account for 60% to 80%. As a consequence of severe CHT.

Key words: posttraumatic epilepsy, traumatic brain injury, neuropsychological testing, brain.

Introduction. According to a number of studies, the debut of seizure formation occurs in the first 5 years after injury. Smelianov A.Yu. (2010), refers to the "critical" period of occurrence of PTE, the late period, explaining this phenomenon, locally caused by symptomatic epilepsy, where the basis of pathogenesis, marked local macro- and micro-structural changes in cortex and subcortical structures, in the form of atrophy of the cortex, cystic changes in brain structure, small-focal calcification changes. Accordingly, PTE is marked by a variety of variants of the clinical picture, of which the largest percentage is observed in generalized, or combined partial seizures (over 55%). The most common among the mechanisms of traumatic seizures studied are fluid-percussion lesions and cortical controlled lesions, or so-called "weight drop" lesions. On the other hand, the inflammation process is triggered, and further there is an uncontrolled increase in the permeability of the hemato-encephalic barrier and Glia activity. It is this multilevel change in the brain that forms the epileptic focus, which produces inter-ictal and ictal epiactivity. In addition, the formation of PTE, is influenced by many factors of exogenous and endogenous levels that enrich both the course of the underlying CHT disease and the pathological process in the form of an epileptic seizure. These include: patient's age, concomitant chronic diseases, bad habits, seizure syndrome in childhood, severe perinatal analysis, genetic risk factor, etc., which indicates the initial presence of background or "basic" predisposition of

brain neurons to form a focus of epilepsy. All the above said predetermined the circumstances for this study.

Purpose of the study. To study clinical and instrumental peculiarities and perform psychoneurological testing in patients with posttraumatic epilepsy who have a background seizure predisposition factor in the analysis.

Material and methods of research. We examined 56 patients with posttraumatic epilepsy who were hospitalized in the Department of Neurology at Samarkand State Medical University during the period 2021-2023, who constituted the main group I. The basis for the diagnosis was: a confirmed document (medical history extract), treatment in the neurosurgery department of Samarkand Emergency Hospital; neuroimaging data, outpatient observation document (for the last 0-5 years from the date of injury). A sample of 56 patients was selected from the total cohort of patients who received craniocerebral trauma in Samarkand during the current period, 730 patients, (by questioning); in addition, patients were included in the study criteria if the background factor predisposition to seizure syndrome in the history of patients was a perinatal disorder in the form of perinatal encephalopathy, or residual encephalopathy. Group II consisted of patients with epileptic disease (idiopathic epilepsy, had a higher percentage of 34%), a total of 38 patients whose treatment depended on their condition at the time of examination (this included both inpatient treatment in a neurology department and outpatient treatment at the place of residence).

Group III was composed of healthy individuals of identical age and sex. In terms of age, the interval was between 20 and 40 years; in terms of sex, a large percentage was male; 73.2%, compared to females. The classification for the distribution of epileptic seizures, was used (ELAE, 1989).

At the first stage of the study (patient selection), registry cards were filled out with a detailed interview of the patient and relatives. Further on, standard methods were used for complex evaluation of patients' condition. Neurological examination, instrumental method of EEG examination (daily EEG). Besides, neuroimaging examination was obligatory (in dynamics); method of psychoneurological testing, examination of cognitive function and anxiety (depression) level; the final stage was the examination of patient's "quality of life". All data were processed on an individual standard package of statistical programs, according to Stundance criteria.

Results of the study. Having started the study of the patients included in the examination group, it was necessary to find out the factors aggravating the process of the main disease of the CHT and complication of the CHT, epilepsy syndrome. For this purpose, we used an anamnestic questionnaire (randomly administered), and divided the examined patients into groups: under 20 years old (A) and group (B) over 30 years old. Among the patients of group A, the etiological factors were the following: a burden at birth (perinatal encephalopathy in the anamnesis); neuroinfection in childhood (and in several cases, accompanied by a convulsive syndrome); craniocerebral trauma. In group (B) we observed: discirculatory encephalopathy (with existing cerebral atrophic process); consequence of acute ischemic circulation disorder (TIA); dysmetabolic disorder; brain tumor was found in one case; craniocerebral trauma.

As can be seen, in symptomatic epilepsy the leading position is taken by craniocerebral trauma, with the fact that the trauma, accounts for the period from 20 to 35 years, the most.

Thus, among the forms of symptomatic epilepsy, posttraumatic epilepsy occupies more than 50%. And among the verified causes of the disease, perinatal disorders and neuroinfections suffered in childhood took the lead, i.e., the background of unfavorable in relation to seizure syndromes was initial. Subsequently, only patients with posttraumatic epilepsy (whose age ranged from 18 to 50 years) were examined.

The result of the analysis of patients by gender distribution showed a male predominance (77.9%), which coincides with the data in the literature. The nature of the development of the first seizures in relation to the period of trauma, it appeared that the "peak" of the occurrence of epileptic seizures was at the end of the first, beginning of the second year after receiving a traumatic brain injury (95.0%). According to the classification, the patients who had received a CHMT had different degrees of trauma thus, mild degree was noted in 40% of cases, moderate degree in 31.3%; severe degree (cerebral contusions with surgical intervention in 29.7%). There was no advantage of any side of the head by the level of localization of trauma, a slight preponderance in the frontotemporal region.

According to the classification of epilepsy type, generalized seizures (85.5%) made their debut in most cases; focal isolated seizures were observed only in 3% of cases. seizures had a feature of formation from single episodes to stable, often repeated, with a certain interval, coinciding with time of day. Thus, the first occurrence of seizures in a month had 25% of patients, in the subsequent months more than 70% of patients.

Partial seizures manifested themselves as somato-motor, or somato-sensory seizures; in some cases, they were combined with loss of consciousness.

The clinical and neurological symptomatology depended on the level of the lesion and the severity of the CMT. Accordingly, the patients also had motor impairment (62.2%), disorders of the TMN (of central character 43.3%). Pathological signs were characteristic, in most cases, signs of oral automatism (37.5%); no less prominent, signs of impaired coordinate symptoms (49.0%). But it is important to note that in patients and their relatives, despite having neurological symptoms (focal), mainly caused anxiety, progressive epileptic seizures.

Neuroimaging examination by MRI of the brain was performed in all patients with PTE, in some cases (86.9%) single or multiple changes in the form of cystic-gliosis foci were detected. Signs of cerebral atrophy were observed in 100% of cases, in parallel there were signs of hydrocephalus (asymmetrical or symmetrical). In repeated MRI scans (in some cases), changes did not change in the dynamics, remained persistent. Evaluating the results, electroencephalographic studies (EEG) in all patients (from 2 to 5 times during the study period), a certain pattern was found, epileptic activity was noted in all patients, even with regional prolonged deceleration, in 45.5% of cases. In terms of localization, coincided with the areas of frequent trauma area (frontal, frontotemporal), in 40% of cases; pathological activity was detected on the left. In a few cases, there was a "mirror focus," contralateral to the trauma focus (16.2%). High-amplitude waves of theta and delta range were observed in 27% of cases, indicating generalized epiactivity. Several patients were referred for analysis of daily EEG monitoring, where in 15% of cases, there was a pronounced frequency of epiactivity during nocturnal sleep.

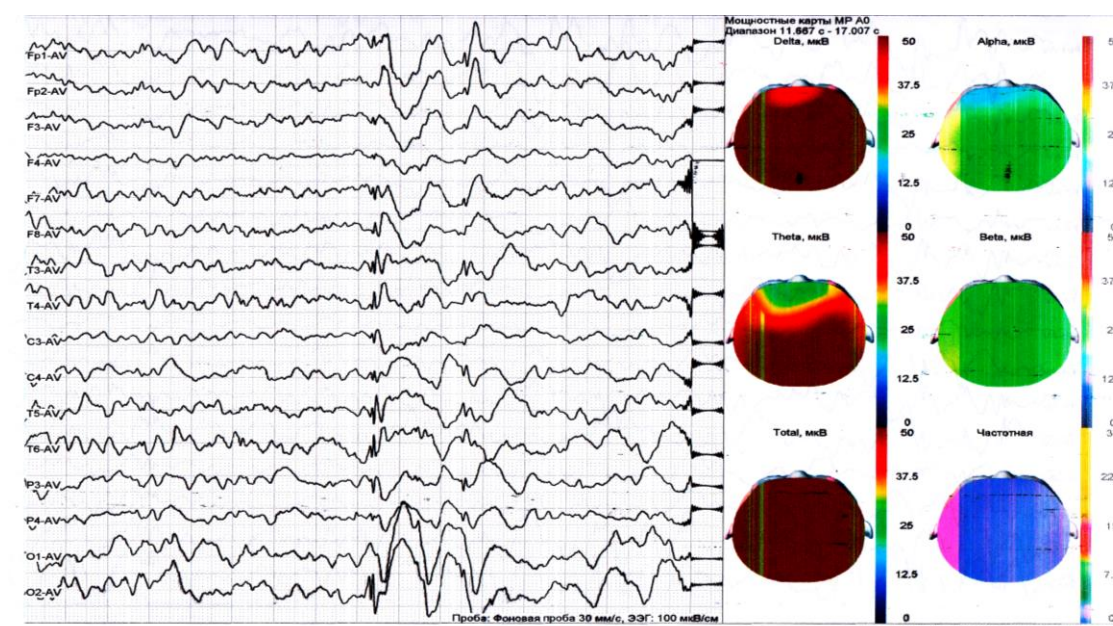


Fig. 1. Patient Sharipov F., 11 years old

It should be noted that patients with PTE, are characterized by psycho-emotional instability, aggressiveness (tendency to abuse alcohol), disposition, discontent with others, inability to work systematically, etc.

In addition, cognitive defects were noted during anamnestic questioning, and, accordingly, there was a need to monitor the level of intellectual impairment in the examined patients. Cognitive status was assessed in 36 patients using traditional neuropsychological scales. The MMSE scores were as follows: 10 patients had a mild level of cognitive dysfunction, where the score was within 27.1 ± 0.3 ; moderate cognitive decline was detected in 21 patients, where the score was 25.1 ± 1.0 ; significant or pronounced cognitive impairment was noted in 5 patients, where the scores, were within the range of 19.0 ± 2.0 . If we consider cognitive defect in the category of clinical symptoms, it was mainly, reduction of memory and attention; slowed rate of thinking; in patients with pronounced cognitive changes, impairment of social disadaptation was noted. Taking into account the most frequent complaints of relatives about emotional lability, patients were evaluated by the hospital HADS anxiety (depression) scale, where 7 patients had normal scores (up to 7); 22 patients (up to 10 scores) had subclinical anxiety (depression) definition; in the remaining 7 cases severe clinical anxiety (depression), more than 10 scores were registered. Thus, these studies revealed rather high results for the level of reduction of cognitive disorders, and the level of high anxiety and depression.

All the above-described changes in patients with post-traumatic epilepsy do not raise doubts about the cause of decrease, criticism of their condition and, as a consequence, the quality of life. Nowadays, there are many questionnaires for determining the concept and level of "quality of life", the QOLIE-31 questionnaire being, in our opinion, the most convenient for practical doctors to use and the most indicative one. For validity, patients with PTE were compared with patients with symptomatic epilepsy of non-traumatic genesis. Based on the questionnaire, we can see clear differences on the signs of the scales, so on the level of "anxiety" the group with PTE is much more anxious and more emotional, so in the group with PTE marked 20.5 points, and in the group with SE-37.8 points on emotional lability, at the same time, the result on "general quality of life" in the group with PTE-55.5 points, and in SE-34.5 points. Thus, patients with PTE were found to have a pronounced restless emotional state and anxiety, compared to patients with SE. Of course, such difference is associated

with trauma (damage) to various parts of the brain, certainly also with stressful surgical situations suffered during the trauma, and the duration of the recovery period, after the trauma, the complexion of one's situation in general.

CONCLUSIONS: Clinical and neurological syndromes and character of epileptic seizures differ in patients with posttraumatic epilepsy and idiopathic epilepsy, bioelectrical activity of the brain in PTE patients is much brighter and more pronounced, as is informative on functional prediction tests, where on EEG there is an increase in interhemispheric leads, indicating increased intercentral connections of the brain. The main predictors for the development of PTE are the severity of the trauma (moderate to severe trauma), the duration of the period (from the beginning of the trauma to the first seizures), the earlier the onset, the worse the prognosis; and, importantly, the predisposing background factor for seizures (history of perinatal disorders, neuroinfections, hereditary predisposition); patient age; and localization of trauma (temporomandibular, frontal or multifocal). The informative value of PTE prognosis is significantly increased by neuroimaging research methods, psychoneurological tests, and EEG-negative patients for a comprehensive approach to therapy.

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