

FEATURES OF COGNITIVE FUNCTIONS IN EPILEPSY DEPENDING ON FOCUS LATERALIZATION

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Resume: Cognitive impairments in epilepsy are a current problem in neurology. The basis of the idea on the pathogenesis of higher nervous system dysfunctions is the interaction of a few factors that include the form and duration of the disease, gender differences, and the impact of antiepileptic therapy.

The role of interattack epileptiform changes in the development of cognitive deficit in adults and epileptic encephalopathies in children is discussed. Up-to-date neurophysiological and neuroimaging diagnostic methods allow the detection of new features in the course and progression of higher nervous system dysfunctions in epilepsy.

Key words: epilepsy; cognitive impairments; antiepileptic therapy.

ОСОБЕННОСТИ КОГНИТИВНЫХ ФУНКЦИЙ ПРИ ЭПИЛЕПСИИ В ЗАВИСИМОСТИ ОТ ЛАТЕРАЛИЗАЦИИ ОЧАГА

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Резюме: Когнитивные нарушения при эпилепсии – важная проблема неврологии. В основе представления о патогенезе нарушений высших нервных функций лежит взаимодействие нескольких факторов, к которым относятся форма и длительность заболевания, гендерные различия, влияние противосудорожной терапии.

Обсуждается роль межприступных эпилептиформных изменений в формировании когнитивного дефицита у взрослых и эпилептических энцефалопатий у детей. Современные нейрофизиологические и нейрови-

зуализационные методы диагностики позволяют выявлять новые особенности течения и прогрессирования нарушений функций высшей нервной деятельности при эпилепсии.

Ключевые слова: эпилепсия; когнитивные нарушения; противосудорожная терапия.

Relevance. Epilepsy is a chronic poly-etiological disease, manifested by repeated unprovoked convulsive or other seizures, impaired consciousness and personality changes [3,7]. Recently, some progress has been made in the treatment of epilepsy [5], and along with the achievement of remission, it is also important to study and correct non-convulsive manifestations of the disease, which include changes in the functions of higher nervous activity (VNI) [6].

Psychosocial problems for patients often come to the fore, including cases where seizure control has not yet been achieved [4,6], and cases of controlled illness. In particular, depression in patients with difficult to control epilepsy has a greater impact on quality of life than, say, frequent seizures. In addition, depression can have a significant impact on cognitive function [1,3]. Complaints about violations of speech functions, memory, attention, thinking that patients may present at a doctor's appointment are in second place after complaints of seizures.

There are some differences between cognitive and behavioral impairments in childhood and adulthood [5,7]. In children, epileptic seizures, as well as therapy with antiepileptic drugs (AED), affect the development of the structures of the central nervous system and the formation of higher mental functions (HMF), which ensure the adaptation of the child's body to environmental conditions.

This leads to pronounced changes in the personal sphere and functions that form the basis of cognitive activity (attention, gnosis, memory, thinking). At the same time, the plasticity of mental processes in childhood makes it possible to compensate for violations with targeted correction. In addition, children have special conditions - epileptic encephalopathies (early malignant encephalopathy

(infantile) and caused by continued activity on the electroencephalogram during slow-wave sleep) [3,5].

In adults and especially elderly people, a long history of the disease, diffuse or gross local damage to the structure of the brain and other factors can lead both to intellectual and mental disorders up to the degree of dementia, and to severe mental disorders that are more rigid to therapy and psychological correction [2].

With the lateralization of the pathological focus, mainly in the frontal lobes of the brain, there are such disorders in the cognitive sphere as difficulties in programming actions, making decisions and developing strategies, abstract thinking and others, which in general determines the ability of individuals to live independently and adapt in society. With regard to the lateralization of the discussed functions in the cortex of the frontal lobes of the brain, numerous studies were carried out, in particular, observation [32], which showed that in this aspect the frontal lobes represent a single area of functioning without a clear difference in sides. This may also be due to the high frequency of occurrence of the phenomenon of the propagation of an electric discharge during the localization of the epileptogenesis focus in the frontal lobe from one hemisphere to another.

In subsequent works D. Upton et al. report that the most pronounced disorders occur when the pathological process is localized in both hemispheres [1,4].

In the therapy of patients with partial as well as total deficits in the higher mental sphere, a significant role is played by targeted psychological correction, supported by antiepileptic therapy [5]. In this regard, Pantocalcin®, which has a complex nootropic, neuroprotective, neurometabolic, neurotrophic, and anticonvulsant effect in combination with a good tolerance profile, can be considered the drug of choice for the symptomatic treatment of epilepsy patients with cognitive, speech and attention disorders.

Thus, the study of cognitive impairment in epilepsy remains an urgent problem of modern neurology. The occurrence of cognitive impairments is an

integral part of the course of epilepsy and affects the general condition of the patient at different stages of the development of the disease.

Purpose of the study. Study of clinical, psychological and cognitive features and mechanisms of disorders of the functional system of the brain in epilepsy, depending on the lateralization of the focus (in connection with the tasks of restorative learning).

Materials and research methods. The study was carried out at the AGMI clinic. The study included 146 patients (60 men and 86 women) with a verified diagnosis of partial epilepsy. The patients' age ranged from 18 to 57 years (average age 29.86 ± 9.6 years), the average duration of the disease was 14.3 ± 9.1 years.

The study used clinical psychopathological, psychometric, neuropsychological, neurophysiological, neuroimaging and statistical methods.

Research results. The results of the study showed that there are special interrelationships between the localization of the focus of epileptic activity, the features of the course of epilepsy, and concomitant psychopathological disorders. It follows from it that the most severe (serial) course of paroxysmal syndrome was observed in frontal epilepsy, although the severity of mental disorders in this form was not maximal.

When analyzing the distribution of patients by forms of epilepsy, depending on the localization and lateralization of the focus in groups with right and left profiles of functional interhemispheric asymmetry (FMA), no significant differences were found: in both groups, the presence of frontal, temporal, and frontotemporal forms, as well as right- and left-sided localization of the lesion was approximately the same. It is possible to note only a tendency towards the predominance of multifocal (frontotemporal) forms in patients with the left PMA profile.

The indicated groups did not differ in such characteristics of the epileptic process as the progression of the paroxysmal syndrome, the number of resistant forms, the type, frequency and severity of seizures. At the same time, significant differences in the groups of patients with right (PPA) and left profiles of functional

interhemispheric asymmetry (LPA) were revealed in relation to the onset of seizures. Patients with LPA had a significantly earlier onset of epilepsy (10.87 ± 6.4 years) than in patients with the right profile (15.80 ± 10.7 years; $t = 2.48$, $p = 0.01$). Apparently, a lower level of education was also associated with the early onset of the disease in patients with PPA than in patients with PPA (11.70 ± 2.5 years, versus 12.98 ± 2.5 years, respectively; $t = 2, 05$, $p = 0.04$).

Differences in the therapeutic dynamics of seizures in individuals with different profiles of interhemispheric asymmetry concerned only complex partial seizures. No significant differences in the severity of mental disorders in epilepsy patients with right and left PMA profiles were found in the present study.

However, some correlations were found, reflecting the peculiarities of the influence of the epileptic process on psychopathological symptoms in patients with different profiles of functional asymmetry.

A comprehensive clinical and neuropsychological examination made it possible to establish that a combination of cognitive and emotional disorders occurs in 30% of epilepsy patients, depending on the lateralization of the focus.

Continuous video-EEG monitoring in patients with epilepsy is an informative neurophysiological technique in determining the localization of epileptic activity and recording focal and secondary generalized seizures.

In patients with epilepsy, a combination of mild and moderate cognitive impairments with subclinical severe anxiety and depressive disorders was revealed.

A comprehensive clinical-neuro-psychophysiological study of patients with symptomatic post-traumatic epilepsy has shown the effectiveness of the combined use of ethyl-methyl-hydroxy-pyridine succinate with basic antiepileptic drugs, a decrease in the number of seizures, normalization of the bioelectric activity of the brain, reduction of paroxysmal phenomena of neuropathy to an improvement in EEG indicators and quality of life.

Output. The results of the study make it possible to improve the diagnosis of cognitive impairments, taking into account the structure of the defect, severity and

age dynamics, which is of great theoretical and practical importance for in-depth assessment of their clinical manifestation.

It becomes possible to more accurately identify speech dysfunction at the very onset to the stages of formation (HMF), to carry out differentiated diagnostics of cognitive impairments, to determine the progression of the epileptic process, to timely and effectively resolve issues of correcting speech dysfunction and improving the social rehabilitation of patients.

The identification of specific cognitive impairments in patients with epilepsy contributes to the differential diagnosis of the epileptic process and allows timely development of therapy tactics and a system of social rehabilitation measures, taking into account the mechanisms of compensation for cognitive impairments.

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