

ELDERLY EPILEPSY: NEUROPHYSIOLOGICAL ASPECTS OF NON-PSYCHOTIC MENTAL DISORDERS

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Abstract. *In recent decades, rates of epilepsy incidence and prevalence have increased in older age groups. In the recommended material, when examining 181 patients, materials were obtained to draw conclusions about certain characteristics bioelectric activity of the brain, vegetative state in patients with elderly epilepsy, in comparison with groups of elderly patients without pathology. The coherent analysis method and the strategy for analyzing the spatial-temporal organization of the activity of the cerebral cortex using VRS allow a new look at the results of neurophysiological examination for elderly epilepsy.*

Keywords: *epilepsy, old age, bioelectric activity, neurophysiological aspects.*

Introduction. The relevance of research on various aspects of late-age pathology depends on many factors, but primarily on the increase in the proportion of the elderly in the total population of many countries of the world [1-3]. In this regard, the problem of the occurrence of epileptic seizures in adults and the elderly is of particular importance [4-6]. The proportion of patients with "late epilepsy" among all patients with epilepsy is 11% [7-10]. Despite the active study of elderly epilepsy (EPV), currently the study of the Epilepsy neurophysiology of this group occupies a modest place in assessing brain activity in this pathology, both at the beginning of the disease and in the dynamics of the rehabilitation process [11-15].

The current state of Neurophysiology problems is the consideration of bioelectric activity of the brain and the new concepts of solving the problem of epilepsy, including the inverse of EEG belgilaydi.va in old age. In addition to evaluating the usual visual picture Data, great importance is currently attached to the methods of mathematical processing and localization of sources of pathological activity of the cerebral cortex and underlying structures as one of the directions for analyzing the pathophysiology of neural networks their relationship with the clinical picture of epilepsy, the degree of psychopathological manifestation of the disease [16-20]. The topical, descriptive system of local and interhemispheric manifestations of activity of different frequency ranges is replaced by a methodology for the spatial-temporal organization of pathological states of the brain and its components, including in the analysis of non-psychotic mental disorders in epilepsy [21-24].

Research results from various authors prove that the incidence of epilepsy forms with non-psychotic Affective Disorders, borderline anxiety, and epilepsy with affective disorders ranges from 11% to 66% [25-27]. A catamnestic examination of 1,283 EPV patients (over 60 years of age) registered in urban Epileptology allowed 98,13% of patients to determine whether comorbid psychopathological symptomatology contained various sensory-Affective Disorders [28-31]. We

want to add to this the interaction of these factors with the higher mental functions of the individual, taking into account the concept of synergistic analysis of the processes of alteration of somatic, neurophysiological, neurochemical processes and the "transverse" cross section of the psychological characteristics of the patient with epilepsy. One method of interest to EEG analysis is consistent channel data analysis, average consistency, and average spectral power assessment [32-36].

The consistency of the electrical signals of the brain (kog) is a quantitative indicator of the synchronicity of participation in the functional interaction of various cortical zones, which ensures the integral activity of the brain [37-39]. The values of the cog coefficients vary from 0 to 1: the higher the cog value, the more activity of a given area is normal and consistent with other activities chosen for measurement in pathology. Many researchers cite consistent analysis data in non-psychotic and psychotic psychiatric disorders, sometimes with polar inferences and inferences [40-43]. The authors note that in patients with right brain asymmetry (PPA) with hypersensitivity of paroxysmal syndrome, the functions of the frontal parts of the brain are affected, in this regard, cognitive disorders and a decrease in executive functions are observed. Conversely, in patients with left hemisphere asymmetry (LPA), the progredience of seizures is associated with impaired affective circle and other psychopathological signs [44-47].

This means involving more temporal structures in the process, in particular the limbic system responsible for the affective sphere. Other authors argue that left and symmetrical types are associated with high levels of introversion, anxiety, hypochondriac complaints, fear, low levels of self-control [48-50]. Studies dedicated to assessing the spatial temporal organization of brain biopotentials in patients with elderly epilepsy have not been found in the literature we have, which assumes the timely execution of such observations [51].

The purpose of the study: according to the spectral analysis of coherence and potency in patients with elderly epilepsy, determine the most common and specific EEG characteristics, identify possible correlational relationships with the frequency and degree of manifestation of emotional affective disorders affecting the quality of life of patients. Assess the condition of the autonomic nervous system and its relationship with the degree of clinical manifestation of epilepsy.

Materials and research methods. Three groups of patients (181 people) were examined, of which patients (141 people), who have experienced ischemic-type acute cerebrovascular accident (ONMC) in various arterial basins of the brain over the past 3-5 years, in 101 patients the course of the disease was complicated by symptomatic local epilepsy. In the first control group of observations (40 people: 20 men, 20 women) without gross neurological disorders. In Group 2 (101 patients), the underlying etiological disease (stroke, brain damage, brain tumor, neuroinfection) was complicated by the development of symptomatic, localized epilepsy. In Group 3 of patients with stroke consequences (40 people: 21 men, 19 women), paroxysmal cases of an epileptic nature were not recorded. The median age of Group 1 patients was 63,00 years (60,06 years), Group 2: 62,5 years (61,5 years), Group 3 was 62,5 years (61,5 years). Standard neurological, neuroimaging, psychological, and neurophysiological examinations were performed on all patients. During the studies, EEG indicators were analyzed in mean compliance (SRCOG), spectral power (sm), channel compliance (cog), while cog processing took into account the average (0,45-0,649) and strong (0,65-1,00) compliance indices.

Results and their discussion. The following results were obtained when analyzing EEG neurophysiological data in 3 groups of patients by the method of cross-correlation comparison. A study of EEG spectral power (sm) found significant statistical differences between norm Indicators, Group 1 (N=40 patients), Group 2 (n=101, patients with symptomatic epilepsy). An increase in spectral power in the Delta and theta ranges, especially in the frontal and temporal regions, the retention of these indicators in the beta range in the frontal and central regions, with a relatively homogeneous image of this indicator in the alpha range. The same exact spectral power difference is observed when comparing groups 2 and 3 of patients. Thus, we observe the image of increased slow wave bioelectric activity of the cerebral cortex in patients with elderly epilepsy, in which local activity is focused on the frontal, central and temporal regions of the cerebral cortex. Comparative studies on EEG using channel consistency assessment have yielded the following results: in control group 1 (N=40) we observe strong CI coherent indices (greater than 0.65) only in the alpha range, localization in frontal areas (Fp1, Fp2, F3, F4, F7, F8) and right occipital-parietal (O2, P4). The number of strong coherent connections dominates all ranges in Group 3, especially alpha, in the anteroposterior, temporal, and occipital-temporal regions (Fp1, Fp2, T3, T5, P3, O2), with activity moving to the left hemisphere, the surface of interhemispheric asymmetry.

In all ranges, the “newest” pathological connections are observed in Group 2 of patients: with the formation of interhemispheric bonds (T6-P3, T4-T3, P4-O1), significant differences in the Delta and theta ranges, which are later increased in the number of bonds. areas in the posterior temporal region, anterior frontal right, parietal left (T6, T5, F8, P3). The leading place in the composition of non-psychotic mental disorders (NPDS) in the patients we examined was occupied by depressive and anxiety disorders, but the proportion of these NPDS found in The compared groups was different: depression was found in 68,96% and 21,4% of patients with epilepsy. only% of patients with onmc have anxiety disorders in 21,4% and 64,3% respectively. In comparable groups, the BDI depression averages were $34,81 \pm 2,73$ and $28,57 \pm 3,07$ points, respectively, and HRDS was $21,84 \pm 1,50$ and $13,79 \pm 1,36$ ($p \leq 0,01$), respectively. In the study of symptomatic psychopathology under the SCL-90-R methodology, the following results were obtained: the general severity index of GSI symptoms (symptom severity general index) scored 1,21 in the second group and 0,70 in the third group. There is a clear correlation between the overall severity index of depression, anxiety, and symptoms in Group 2 patients, as well as a number of other psychopathological factors. In Group 3, weak correlational correlations between anxiety and overall symptom severity index (GSI) were found, which did not significantly affect other factors of psychopathological symptoms. Analysis of intermediate coherent indices (0,45-0,65) also shows heterogeneity of the BEA cortex in all three groups of patients examined. The smallest, characterized by cortical formations and uniform distribution by relative symmetry, was found to have an average number of bonds in control group 1, which is typical of older patients and has their age norm, characterized by greater activity in the alpha range. The highest number of intermediate contacts in Group 2 patients, especially in the Alpha and theta bands, have relative distributional symmetry, but slow wave characteristic is noted with sliding elements of right hemisphere activity, a component of interhemispheric interactions, especially with increasing frequency rhythm (Delta to beta). Observation Group 3 is characterized by increased activity compared to the control group, but differs from the group of patients with epilepsy: Theta rhythm, less consistent connections in the Alpha and beta ranges, a significant decrease in slow wave activity indicators, symmetrical distribution of Bea coherence in the alpha range. Thus, the slow-

wave activity of strong and medium coherent communication in patients with epilepsy has been recorded much more accurately compared to Groups 1 and 3 of patients, the bioelectric activity of the cerebral cortex has significant differences in EEG pictures, the growth of interhemispheric asymmetry on the right side and a certain location of processes affect the study of spectral EEG found significant statistical differences between normal Indicators, Group 1 (N=40 patients), and group 2 (N=101, symptomatic epilepsy). In the Delta and theta ranges, especially in the frontal and temporal regions (Fp1, F7, F8, T3, T5), an increase in spectral power was noted, which was maintained in the beta range in the frontal and central regions with a relatively homogeneous image of this indicator in the alpha range. The same exact spectral power difference is observed when comparing groups 2 and 3 of patients (see Figure). 2). The leading place in the composition of non-psychotic mental disorders (NPDS) in the patients we examined was occupied by depressive and anxiety disorders, but the proportion of these NPDS found in the compared groups was different: depression was found in 56,3% and 21,4% of patients with epilepsy. patients with ONMC alone and anxiety disorders are 8,7% and 64,3% respectively, with mild cognitive impairment 11,7% and 7,2% respectively (see Figure). 3). In comparable groups (groups 2 and 3), the BDI depression averages were $34,81 \pm 2,73$ and $28,57 \pm 3,07$ points, respectively, while HRDS was $21,84 \pm 1,50$ and $13,79 \pm 1,36$ ($p \leq 0,01$), respectively. In the study of symptomatic psychopathology under the SCL-90-R methodology, the following results were obtained: the general severity index of GSI symptoms (symptom severity general index) scored 1,21 in the second group and 0,70 in the third group. Group 2 (EPV) patients have an overall weight index of depression, anxiety, and symptoms, as well as a clear correlation relationship between a number of other psychopathological factors. In Group 3 (consequences of ONMC), weak correlational correlations between anxiety and general severity index of symptoms (GSI) were found, which did not significantly affect other factors of psychopathological symptoms.

Conclusions: Analysis of the neurophysiological picture in patients with elderly epilepsy allows us to draw conclusions about the significant differences of this group from other groups of nosological age-related pathologies. Evaluation of EEG by the channel compliance comparison method found significant differences in all frequency rhythms (Delta, Theta, Alpha, beta-1) in EPV patients, confirming the clear effect of the epileptic process on the state of neural connections of different regions of the brain, including exacerbation of non-psychotic mental disorders. to a group of patients with symptomatic epilepsy. The spectral power factor varies significantly across three groups of those examined, with the greatest values found in elderly epilepsy patients, which may be a clinical and neurophysiological predictor of the activity level of the epileptic process. Gradual changes in wave activity with interhemispheric connections in the Posterior-temporal, parietal and occipital lobes, the presence of pathological changes in the alpha range in epilepsy patients (posterior temporal region, anterior frontal right, left in the parietal region-T6, T5, F8, P3) are characteristic "markers". EPV. The results of the study show that the incidence of emotional-Affective Disorders in patients with EPV has increased statistically significantly, with a focus only on increased depression compared to stroke patients. The degree of severity of depression and anxiety affects and is directly related to other psychopathological manifestations of epilepsy (somatization, phobia, psychotism, interpersonal sensitivity, hostility, obsession, coercion), compared only to a group of patients with onmc consequences. A neurophysiological picture of brain activity obtained by the correlation comparison method shows that patients with

symptomatic post-stroke epilepsy in old age have an interaction between the level of local BEA disorders and the severity of psychopathological manifestations, especially depression.

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