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Research Article

CLINICAL AND NEUROLOGICAL FEATURES OF PATIENTS WITH ENDOCRINE PATHOLOGY

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ABSTRACT

The autonomic nervous system plays an important role in the functioning of the human body. It regulates the work of internal organs, ensures the maintenance of homeostasis, adaptive reactions, motor and mental activity, affects immunity and emotions. In turn, the imbalance of the functional state of the patient's brain leads to disruption of the activity of nonspecific systems and is manifested by characteristic disorders in the cognitive, mental and vegetative status of the patient. The mechanism of chronic pathological adaptation is based on an automatic metabolism, genetically predetermined with the participation of the regulatory role of the nervous and endocrine systems.

KEYWORDS

Hypothalamic-pituitary system, autonomic nervous system, epilepsy, cognitive impairment.

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INTRODUCTION

Violation of the functional state of the patient's brain leads to an imbalance in the activity of specific systems and is manifested not only by electroencephalographic features but also by characteristic disorders in the patient's cognitive, mental and vegetative status [1, 5, 9].

In this regard, the study of the functional status of the hypothalamic-pituitary system (HPS) in epilepsy will contribute to the expansion and in-depth study of pathogenetic mechanisms that will contribute to the optimization of modern diagnostic methods, which in turn will give a more complete picture of the clinical manifestation of this disease and optimize treatment methods [2, 7, 8, 10].

The hypothalamus is an important link in the system of regulation of cerebral functions and regulates many additional pituitary processes on the one hand and on the other hand controls the state of the adeno-pituitary gland constitutes a single hypothalamic-pituitary system, hormones are modulators of epileptic activity, which is are prerequisites for optimizing the principles of treatment of these diseases [3, 4, 6].

Most of the available research concerns the studies of hormonal disorders, which were studied during or immediately after a seizure, when urgent mechanisms for regulating hormonal homeostasis are realized. Whereas the interictal period and the formation of a chronic pathological process, provided by slow-acting mechanisms of adaptation, are practically not studied. The mechanism of chronic pathological adaptation is based on automatic metabolism, genetically predetermined with the participation of the regulatory role of the nervous and endocrine systems [5, 8].

Separate pathogenetic mechanisms of epilepsy, neurohormonal relationships and their influence on the course and prognosis of epilepsy have not been studied. The neurological manifestations of dysfunction of the hypothalamic-pituitary system in patients with epilepsy, as well as the role of the hypothalamic-pituitary system in the formation of the clinical manifestations of this pathology, have not been sufficiently studied.

Purpose of the study: to investigate the features of clinical and neurological manifestations of imbalance and disadaptation of the hypothalamic-pituitary system in patients with epilepsy.

Materials and methods of research

Patients with epilepsy who were hospitalized in the neurology department of the 1-Clinic of SamMI for the period 2020–2022 were subject to examination, patients registered in the endocrinological dispensary of Samarkand.

The total number of patients examined was 85, including 40 patients with epilepsy (group 1), 45 patients with epilepsy and signs of hypothalamic-pituitary syndrome (HPS; group 2).

To determine hormones in blood plasma, a radioimmunoassay method was used. All patients were determined the level of triiodothyronine (T3), thyroxine (T4), thyrotropin (THG), adrenocorticotropic hormone (ACGH) and cortisol (using standard commercial kits).

Assessment of the functioning of the autonomic nervous system is carried out according to the method for determining the autonomic index (VI) Kerdo. In accordance with the state of the autonomic

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nervous (ANS) system, 5 tones are distinguished: severe parasympathicotonia - the predominance of parasympathetic tone, the index value > (-31); parasympathicotonia - an intermediate state between the norm and parasympathetic tone, values from (-16 to -30); norm - balance of sympathetic and parasympathetic influences, values from (-15 to +15); sympathicotonia - an intermediate state between the norm and sympathetic tone - from +16 to +30; pronounced sympathicotonia - the predominance of sympathetic tone, the index value > (+31).

All patients underwent EEG studies in dynamics. The structure of the brain was mainly studied by magnetic resonance computed tomography (MRI).

RESEARCH RESULTS

During the examination of patients , attention is drawn to the specificity of the external data of patients of group 2, in particular, overweight in 16 patients ($\chi 2=10.656$; $p=0.453$), while in group 1 it is 2 times less. Striae are clearly visible in the area of the abdominal wall. Young women aged 18–28 years (9) complained (considering the main problem of epileptic seizures) of headache and occasional dizziness.

The duration of the disease in the groups was identical (10.5±2.3 years and 10.9±1.9 years, respectively, in groups), despite these indicators, epileptic seizures in group 2 were severe, seizures were longer and more frequent.

When evaluating the data of VI Kerdo, a moderate fluctuation in the initial autonomic tone was established with a slight predominance of both sympathetic and parasympathetic shifts.

As can be seen from the presented data, in patients with epilepsy, sympathicotonia is noted in most cases; moreover, in patients with HHS burden, sympathicotonia was observed in 52.1% of cases, while in patients of group 1—in 36.8% of cases; Parasympathy was noted in 29.8% of patients with epilepsy along with HHS, while in patients with epilepsy it was in 34.7%. The balance of sympathetic and parasympathetic influences was observed 2.6 times more often in patients of the 1st group.

Expressed vegetative symptoms, vegetative lability, unstable arterial hypertension, often against the background of headaches. The most reliable was the absence of the menstrual cycle (aminorrhea), which confirms the hypothalamic-pituitary syndrome in these patients.

Conducting a clinical study contributed to the establishing of the functional state of HGS in patients with epilepsy, which showed a pronounced polymorphism of pathological syndromes and symptoms caused by epilepsy, which regulates vegetative-trophic and endocrinological functions. The severity of symptoms depended on the presence of a pathological imbalance in the HGS function, i.e., in patients of group 2.

Disorders of the HGS function are most often manifested by the presence of neurotrophic syndrome ($\chi 2=2.877$; $p=0.233$), sleep and wakefulness disorders ($\chi 2=2.523$; $p=0.219$) and the development of emotional and psychological disorders ($\chi 2=6.044$; $p=0.333$). A comparative analysis of the data obtained allows us to conclude that there is more pronounced pathology in patients with epilepsy and HHS.

Neurological examination revealed diffuse symptoms in most patients, however, in patients with epilepsy not aggravated by HHS, disturbances were observed mainly at the cortical-subcortical level, and

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in patients with HHS in this disease, the stem level of the vestibular system was involved in the pathological process.

Changes in bioelectrical activity in epilepsy, observed by us in the interictal period, are similar to those described in the literature, however, computer processing of the electroencephalogram revealed differences between the data of studies of patients of the 1st and 2nd groups. Patients with epilepsy aggravated by HHS were characterized by a shift in the average effective frequency of the spectrum towards pathological slow-wave activity, as well as the presence of signs of dysfunction of the mid-deep structures of the brain and a change in the correlative relationships between the main EEG rhythms.

In the study of the hormonal status in patients with epilepsy, data were obtained indicating significant changes in the hormonal function of the hypothalamic-pituitary system, which is manifested by an imbalance of the hypothalamic-pituitary-adrenal and hypothalamic-pituitary- thyroid axis.

In the study of the content of ACTH in patients with epilepsy in the interictal period, no significant changes in its concentration were found. An increase in the level of ACTH, according to the literature, during seizures and its normal content in the interparoxysmal period suggests that ACTH is a factor in the body's adaptation to stress.

A significant increase in cortisol levels varied depending on the duration of the disease and was maximum in patients ill for more than 5 years (mean values 7.4±0.09 years).

Since glucocorticoids increase the synthesis of serotonin, reduce the level of GABA in the brain, increase the permeability of neuronal membranes for Na + and Ca +, and reduce the synthesis of proteins in the brain, an increase in the level of cortisol can decrease the convulsive threshold and a characteristic sign of an epileptic seizure. An increase in cortisol levels at normal ACTH values is a manifestation of dysregulation in the hypothalamus-pituitary-adrenal system.

A decrease in the content of T3 in the blood plasma of patients with epilepsy and significant variability in the level of T4 and TSH in all examined patients were established. Moreover, the severity of changes in thyroid status correlates with the severity of epilepsy, clinical signs of hypothalamic pathology, as well as with the duration of the disease, the frequency and type of seizure.

Under stress (of any nature), a synergistic increase in the activity of the suprarenal and thyroid complex at the hypothalamic, pituitary, and peripheral levels occurs only in the initial phase. But further activation of the adrenal complex inhibits the function of the thyroid gland at the hypothalamic-pituitary and peripheral levels. These mechanisms explain the presence of subclinical hypothyroidism in the patients examined during the interparoxysmal period.

Thus, the hypothyroid state disrupts bioelectrical processes in organs with a high level of metabolism, including the brain, where the activity of glycolytic and oxidative enzymes decreases. In addition to energy metabolism, the exchange of mucopolysaccharides in the vascular wall is disturbed, the tone of the cerebral vessels decreases.

Recurrent epileptic seizures of various origins are accompanied by persistent disorders of energy metabolism, in particular, a decrease in the rate and coefficient of phosphorylation. With this, anticonvulsants decrease the respiratory activity of

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brain tissue, uncoupling of respiration from phosphorylation, and this aggravates disturbances in the bioenergetics of patients with epilepsy caused using the epileptic process.

T3 deficiency leads not only to a distortion of the hormonal status of the body, but also, to the variety of influences of thyroid hormones, to the development of pathological energy and metabolic state, which aggravates the course of the disease and creates a pathological basis for its progression.

Thus, the functional restructuring of the state of the brain in patients with epilepsy significantly changes the activity of the hypothalamic-pituitary system. This is confirmed by the identified vegetative disorders, changes in the bioelectrical activity of the brain, disorders in the hypothalamus-pituitary-thyroid gland and hypothalamus-pituitary-adrenal glands, and a violation of the integrated connections between these systems.

CONCLUSION

Clinical and neurological picture of disadaptation The hypothalamic- pituitary system is characterized by disorders of the autonomic nervous system with a predominance of sympathetic orientation.

The hypothalamic-pituitary system affects the functional restructuring of the brain in patients with epilepsy and is manifested by polymorphic symptoms, on the one hand, HGS dysfunction increases excitation through biologically active substances, on the other hand, reduces the level of excitation through the synthesis of certain neurotransmitters and disorders of the autonomic nervous system.

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