INTRODUCTION

The paroxysmal conditions are one of the most common pathological disorders in the daily practice of a neurologist. The paroxysm is usually understood as a sudden deterioration in health, which is manifested or accompanied by episodes of illness, or a sharp, short-term (more often repeated) exacerbation of a chronic painful condition. The paroxysmal conditions, as a rule, are not independent nosological forms, but represent a manifestation of a particular pathology of the central nervous system, but it is the presence of paroxysmal symptoms that often causes seeking medical help. These conditions are not only a medical problem, but also a social problem [1].

The urgency of the problem of paroxysmal pathology is due to the fact that some paroxysms threaten the lives of patients, and most of the paroxysmal conditions are disabling.

According to the classification according to V. A. Karlov, all paroxysms are divided into:
1) epileptic;
2) non-epileptic (syncopal states, fainting, collapse, stress attacks with compression of the vertebral artery, facial paroxysms, hypo- and hyperkaliemic myoplegia, myasthenic crisis, as well as vegetative disorders, muscle dystonia and other paroxysmal motor diseases, restless legs syndrome and periodic movements in sleep, various paroxysmal neuralgia) [2].

Non-epileptic states can be defined as sudden, destructive, changing behavior, sensitivity, thinking, sensations that are usually limited in time and similar to or mistaken for epileptic seizures [3].

These paroxysmal disorders are extremely heterogeneous in nature. A significant part of them is associated with neuroses and psychogenic disorders. However, somatogenic disorders (migraine, panic attacks, vestibular paroxysms, hyperparathyroidism, etc.) occupy an equally significant place in the genesis of these conditions [4].

A seizure is the transient manifestation of abnormal excessive or synchronous electrical brain activity that causes convulsions, loss of consciousness, and or lapses of consciousness. The underlying cause of seizures is a state of neuronal hyperexcitability that may be temporary (e.g., due to electrolyte imbalances) or more permanent in nature (e.g., due to inherited or acquired neural abnormalities). Seizures can be triggered by a variety of circumstances depending on age, environmental factors, and underlying conditions. Acute symptomatic seizures (provoked seizures) have identifiable precipitating factors (e.g., stroke,
traumatic brain injury, alcohol withdrawal), whereas unprovoked seizures occur in the absence of identifiable causes. Reflex seizures are states that occur consistently in response to a particular trigger [5].

The problem of differential diagnosis of paroxysmal states is one of the most difficult tasks in neurology. It is due to a number of subjective and objective reasons: an insufficiently complete and accurate description of the clinical features of the seizure by patients and their relatives, often low information content of additional laboratory and instrumental research methods, the transient nature of disorders and often the absence of objective symptoms in the interparoxysmal period, insufficient awareness of doctors and medical staff about the clinical features of a number of paroxysmal conditions, etc. Among neurological paroxysmal conditions, the most difficult, requiring highly qualified clinicians is the differential diagnosis of epileptic and non-epileptic states. Sudden disturbances of consciousness, paroxysmal motor disorders, paroxysmal changes in behavior, crisis vegetative states are often mistaken for epilepsy [6].

Published retrospective and prospective studies suggest that 1 out of 4 patients with “epilepsy” was mistakenly diagnosed based on the analysis of clinical manifestations and the results of tilttest.

According to leading epileptologists, up to 20-30 % of patients diagnosed with epilepsy and receiving antiepileptic treatment suffer from non-epileptic states. Up to 45 % of patients diagnosed with refractory epilepsy have non-epileptic states (Table I).

Y. Xu et al (2016) in their review cite data indicating a significant number of false diagnostics of epilepsy even in specialized highly qualified medical institutions (Fig. 1) [7].

The diagnosis of paroxysmal states in neurology is one of the most difficult problems. The differential diagnosis of epileptic and non-epileptic paroxysmal states causes particular difficulties, due to the lack of absolutely reliable clinical markers of the disease in the interparoxysmal period, not always sufficient information content of instrumental research methods and insufficient awareness of doctors [8].

The problem of differential diagnosis of paroxysmal conditions is difficult, since it belongs to the category of multidisciplinary. The main problems of differential diagnosis of paroxysmal states lie in the field of neurology, cardiology and psychiatry in patients [8].

The article presents a clinical case of an erroneous interpretation of the diagnosis in a 27-years-old young man, taking into account complaints, anamnesis of the disease and life, neurological status, laboratory results, features of the EEG, MRI.

**ETHICAL ASPECTS**

The work complies with the ethical standards of the Declaration of Helsinki by the World Medical Association. A written informed consent was obtained authorizing the publication of the medical history and the results of the examination.

**CASE REPORT**

Patient P, 27 years old (06.08.1993), was admitted to the military hospital on 08.04.2021 with complaints of periodic, with a frequency of 1-2 times a month, attacks of tonic tension of the muscles of the right extremities, which last several seconds, are provoked by active movements.

It is known from the anamnesis of the disease that periodic attacks of tension in the right extremities have been bothering since the age of 12, the patient has not sought medical help until now.

The patient notes the deterioration of the condition in the form of increased frequency of seizures and an increase in their duration for the last 2 years.

He consulted a unit doctor in March 2021. An MRI scan of the brain was performed, it was not found pathology. The patient was referred to the neurological department of military unit for further examination and treatment.

At the time of the examination, the patient’s general condition is satisfactory. A man for a regular physique. The skin is clean, normal color. The visible mucous membranes are normal color. The thyroid gland is not enlarged, it is painless. Peripheral lymph nodes are not enlarged. Above the lungs, a pulmonary sound is heard,
vesicular breathing. The pulse is rhythmic, heart rate is 66 beats/min, blood pressure is 120/80 mm Hg. The boundaries of the heart are within the normal range. The heart tones are clear, the rhythm is correct. The abdomen is soft, painless on palpation. The liver and spleen are not enlarged. Pasternatsky symptom is negative on both sides. There are not edemas. Physiological functions are controlled.

In the neurological status: the level of consciousness is clear, it is oriented correctly in time and place, intelligence corresponds to age. He is available to the productive contact in full. Meningeal signs are negative. Palpebral fissures, pupils are D=S. The light reflex is of average vivacity. The movements of the eyeballs are possible in full. Convergence is weakened. Nystagmus, diplopia are absent. The nasolabial folds are symmetrical. The pharyngeal reflex is triggered, swallowing is not disturbed. The tongue is moist, is not overlaid, along the middle line. Speech is not broken. Phonation is normal. There are not bulbar violations. Muscle tone is preserved. Muscle strength is sufficient. Tendon and peristeal reflexes from the hands D=S, knee D=S, Achilles D=S, of average vivacity. There are not pathological feet signs. Sensitive disorders are not detected. The finger and knee-heel tests are performed satisfactorily. He is persistent in the Romberg pose. The coordination tests are performed satisfactorily. The vegetative reactions are revived.

During the entire period of stay in the military hospital, the following studies were conducted:

There were not significant deviations from the reference values in general clinical blood and urine tests.
Biochemical blood assay (09.04.2021): ACT 18.7 Od/L; ALT 16.1 Od/L; blood urea 2.9 mmol/L; creatinine 91.3 mc mol/L; blood glucose teste 5.3 mc mol/L; LPH 55.7 Od/L.

SARS-CoV-2 antibody assay to the nucleocapsid antigen (09.04.2021): IgM and IgG were not detected.

Thyroid hormones (13.04.2021): Т4 – 18.8 mmol/L; TSH – 1.09 мcМО/mL; ТPО – 11.8 Od/mL.


Fluorography of chest organs (09.04.2021): without pathological findings.

EEG (15.04.2021): pathological EEG complexes have not been registered.

ECHO (13.04.2021): without pathological findings.

Diagnostic ultrasound of thyroid (13.04.2021): without pathological findings.

Head MRI (27.03.2021): on the hands.

Against the background of a complete collection of complaints, anamnesis of the disease and life, as well as the
results of laboratory and instrumental research methods, this patient was diagnosed with ‘Idiopathic epilepsy with simple partial tonic seizures. S-shaped scoliosis of the thoracic spine of the first degree’ [8], [17].

The patient was prescribed treatment: compliance with the regime, diet, taking carbamazepine 0.2 2 tablets 2 times a day.

During the treatment in the military hospital, the patient did not notice a significant improvement. Isolated seizures of tonic tension of the muscles of the right extremities were recorded. The patient’s condition is satisfactory.

The patient is recommended to avoid physical and emotional overloads, observe the work and rest regime, follow up with a neurologist, take levetiracetam 250 mg 2 times a day for 2 weeks, then 500 mg 2 times a day for a long time. The patient was discharged from the military hospital on 23.04.2021.

Subsequently, patient P. was consulted by a neurologist on 06.05.2021. The patient complained of periodic seizures in the right extremities in the form of muscle contractions, which are provoked by emotional and physical exertion. The patient has paroxysmal states of unclear genesis, which need to be clarified. It has not the features in the neurological status of a patient. It is recommended to do a diagnostic head MRI with 3 T – the presence of cortical dysplasia, the presence of focal pathology; and also to do EEG and EEG video monitoring (24 hours) with the cancellation of levetiracetam 4 days before the start of the examination. The next inspection after the additional examination.

The patient underwent an EEG (06.05.2021): a medium-voltage EEG torrent with dominant δ-activity. The main violations of bioelectric activity in the alpha-rhythm range, the correctness of its zonal distribution, amplitude values and fusiformity are preserved, the alpha-rhythm is expressed by flashes of up to several seconds, separated from each other by sections of low-amplitude polymorphic slow activity, the intervals between alpha-rhythm flashes are filled with a flat EEG, generalized flashes of slow-wave activity, mainly in the central leads, against the background of normal electrical activity. It were not detected the specific EEG phenomena (Fig. 2) [14], [15].

The patient performed EEG video monitoring (24 hours) on 23.05.2021. The following conclusion was obtained: diffuse disturbances in the bioelectrical activity of the brain and local changes were not registered. Single epileptiform discharges were recorded in the inferior forehead-temporal region. Revealed dysfunction of the median structures of the brain. The seizures recorded during the survey are most likely non-epileptic in nature. It were not detected the specific EEG phenomena (Fig. 2) [14], [15].

Head MRI 3 T (epileptic protocol) (09.05.2021): MR-signs of cytotoxic lesions of the corpus callosum (CLOCCs-syndrome). MR-signs of mesial temporal sclerosis and cortical dysplasia of the brain were not detected (Fig. 4).

The neurologist consultation (31.05.2021): The complaints are the same. It has not the features in the neurological status of a patient. Taking into account the data of instrumental research methods, the patient was diagnosed with “Cytotoxic lesion of the corpus callosum (CLOCCs-syndrome) with motor paroxysms of non-epileptic genesis”. It were recommended: consultation and examination by an infectious diseases specialist-virologist. Levetiracetam should be gradually discontinued.

After consultation with a neurologist, the patient turned to the laboratory and donated blood to the infection panel, in particular for the presence of antibodies to the Epstein-Barr virus.

Assay for the presence of IgG antibodies to the Epstein-Barr virus capsid antigen VCA (EBV VCA IgG) (04.06.2021): 15,39 Od.

Assay for the presence of IgM antibodies to the Epstein-Barr virus capsid antigen VCA (EBV VCA IgM) (04.06.2021): 0,31 Od.

Assay for the presence of IgG antibodies to the Epstein-Barr virus nucleonic antigen (EBV EBNA-1 IgG) (04.06.2021): 12,82 Od.

Thus, the constant presence of VCA IgG in high titers indicates a chronic phase of infection caused by the Epstein-Barr virus. The reason for the positive result may be the presence of active immunity due to a previously transmitted infection, along with the detection of antibodies to the nuclear antigen (EBNA) and the absence of IgM to the capsid antigen (VCA) of the Epstein-Barr virus.

After another visit to the neurologist, the patient was diagnosed with the following: “The consequences of neuroinfection in the form of cytotoxic lesions of the corpus callosum (CLOCCs-syndrome) with motor paroxysms of non-epileptic genesis. Viral infection caused by the Epstein-Barr virus is in remission”.

An example of differential diagnosis of paroxysmal states using instrumental methods was presented to Your attention. This clinical case demonstrated how, thanks to the methods of functional diagnostics, the patient’s diagnosis was changed from idiopathic epilepsy to CLOCCs syndrome of non-epileptic genesis associated with infection.

Cytotoxic lesions of the corpus callosum (CLOCCs) is a concept that combines a heterogeneous group of pathological conditions that cause changes in the signaling characteristics of the corpus callosum, in particular, the roller [9].

Cytotoxic lesions of the corpus callosum (CLOCCs) represent a group of conditions that cause MRI signal intensity changes in the corpus callosum. Etiology of this phenomenon is very heterogeneous. CLOCCs are associated with a spectrum of metabolic disorders, drug therapy, infections, epileptic seizures and many other causes.

Complex interdependent mechanisms regulate cytokine levels and, ultimately, glutamate levels in the brain. With trauma, infection, and inflammation, macrophages become active and release the inflammatory cytokines interleukin 1 (IL-1) and IL-6, beginning the cascade that leads to cytokinopathy. Monocytes then activate and also release IL-1 and IL-6. T-cells are subsequently recruited and affect the endothelial cells, making the endothelial cells leaky (breaking down the blood-brain barrier) and stimulating them to produce tumor necrosis factor-α (TNF-α). Astrocytes, in turn, are stimulated by IL-1 to release glutamate and block reuptake of glutamate, thus increasing extracellular gluta-
Cytotoxic lesions of the corpus callosum are secondary lesions to a variety of causes, most notably metabolic diseases, seizures, infectious diseases, and drug action. The pathophysiological processes leading to signaling changes in corpus callosum (CC) have not yet been fully understood and described. This is probably the result of a cascade of complex mechanisms, especially inflammatory changes and an increase in extracellular glutamate levels in the brain, manifesting as cytotoxic edema.

Clinical manifestations are very variable. Neurological impairment varies from mild to severe, but may also be absent. The most common non-specific symptoms are headaches or fever. The main examination method is MR with a typical finding of diffusion restriction with correlate on apparent diffusion coefficient (ADC) maps. The key to successful therapy is to identify and treat the cause. The lesions are reversible in most cases, and the prognosis is very good, but also depending on the underlying pathology.
As the availability of MRI has improved and the number of examinations has increased in recent years, the number of findings that can be termed cytotoxic CC lesions is also increasing. This trend will certainly continue in the future, which will allow a further understanding of the causes, origin, manifestations and other mechanisms of CLOCCs, which have not been described, with a larger number of patients.

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