Hashimoto’s Encephalitis Presenting with Seizure: A Case Report

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Introduction

The Hashimoto’s Encephalitis (HE) is a rare autoimmune neuroendocrine syndrome associated with high titer throughout of the antithyroid antibodies [1-3]. Distinctive feature of HE is a positive response to the treatment with corticosteroids; thus the syndrome has the second name - a steroid dependent encephalopathy associated with an autoimmune thyroiditis (SREAT). In 1966 English neurologist Brain [4] for the first time has described the patient suffering from an autoimmune thyreoiditis with passing episodes of a hemiplegia, convulsive attacks with consciousness and vision disorders. The interrelation between a high caption of the antithyroid antibodies and neurologic symptomatic has been designated for the first time and there was offered the research of level of these antibodies in all cases of inexplicable encephalopathies. Some authors suggest that HE may manifest in autoimmune cerebral vasculitis [5].

According to literature the prevalence of HE is 2, 1 on 100 000 thousand population. Average age of the beginning of the disease is 44 years, women suffer 4-5 times more often than men. We carried out the literary review during which we established prevalence of clinical implications of the HE: rest tremor (84%), seizure (66%), epileptic status (12-20%), transitional aphasia (73%), hypersomnia (63%), dynamic ataxy (63%), myoclonias (38%), depression of cognitive functions (36%), alienations (36%) [1, 6, 7].

Because of lack of accurate diagnostic criteria, variety of the clinical implications imitating a picture of various neurologic and psychiatric disorders HE often remains undiagnosed [8]. One of the leading mechanisms in formation of the HE and its activities is disturbance of the hematooencephalic barrier, due to development of the T-cellular lymphocytic vasculopathy against the background of an autoimmune reaction of anti-thyroid antibodies against brain cells [9, 10]. In the literature we did not meet the detailed clinical description of features of a seizure in clinic of the HE. We made clinical trial of neurologic disturbances in the HE, the EEG role - and MRI-researches is defined at diagnosis. On the basis of the results, the correlation of neurologic disorders with severity of development of encephalopathy and severity of a condition of patient is carried out.

Purpose

To specify clinical, neuroimaging, immunologic, neurophysiological features of Hashimoto’s Encephalitis (HE) on the basis of clinical case for rising of efficiency of diagnostics this infrequent disease.

Case Presentation

The patient is Caucasian woman 44 years old, came to the regional hospital’s neurology unit on the 10th day from the disease manifestation with complaints of headache and general weakness. From the medical history it was known that 10 days prior to consultation the patient had the expressional alalia as paraphasias. The patient was brought to the clinic where she had the first convulsive attack with consciousness disturbance which manifested with tonic and clonic cramps. Standard MRI of the brain, lumbar puncture was done. After the complaints and disease history collecting, differential diagnoses were disturbance of the cerebral circulation (stroke) or the nervous system infectious lesion (encephalitis) as the most probable diseases for this patient.

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At neurologic survey the following signs were taped: the meningeal signs were negative, elements of the motor aphasia (paraphasia), the anomia were taped. The Mini-Mental State examination resulted in 24 points. The disturbance of verbal short-term memory was noted. The pupils are equal. Photoreaction was alive. The nystagmus is horizontal. There were strength and the movements of extremities. The tendon reflexes are high mostly on the left side. There was clonus of the left foot. There are no pathological-foot signs. The sensitivity examination was normal. The Romberg test was unstable. The cerebellar test was normal.

There were previously diagnoses assumed: “The encephalopathy of difficult origin”, “The encephalitis”, “The system diseases with neurologic manifestations”.

The anticonvulsant therapy (Levetiracetam of 1000 mg per day), the anti-infectious therapy (Valaciclovir 1500 mg per day, Cridanimodum 250 mg per day), the metabolic therapy (Citicolinum 500mg/days) to the patient were prescribed. On the 10th day from the onset of the illness the standard EEG research was conducted. The theta-delta activity slowly wave domination in all assignments, the high-frequency beta-activity, the existence of single sharp waves with accent in R-assignment, the tendency to generalized paroxysms in the theta range were revealed. There was a little alpha rhythm (amplitude is up to 30 mV). The test with hyper ventilation is not fully carried out due to deterioration of the patient’s health.

There were diagnosed the expressed brain changes with the stem structures of the brain (the research is conducted at the same period with the anticonvulsive therapy). There was found out from the medical history that the patient has no chronic diseases and denies existence of surgeries in the past.

On the 15th day of the disease the patient didn’t begin to feel better. Oktagam (Class G immunoglobulins) and Methylprednisolone in doses 1000 mg per day were added to the patient’s treatment. Since the autoimmune encephalitis was the dominating diagnosis in diagnostic search.

On the 17th day from the disease beginning the general clinical inspection and the US inspection of the thyroid gland was executed. In the gland tissues the group of hypoechoic focal appearance (up to 3,3 mm) and hyper echoic focal appearance (up to 3,3 mm) in the right lobe were found. The isoechoic focal appearance is about 10х8 mm was revealed with a hypoechoic contour in the left lobe. The blood was taken for determination of the thyroid gland hormones because of the presence of structural changes of the parenchyma of the thyroid gland on the 18th day from onset of the illness. Also MRI of the brain with contrast agent was carried out. The foci of the high MR-signal about of 1x2mm, mainly in basal ganglia, were found on series of the received MR-tomograms in the sagittal, the axial and the coronary projection in T1, T2, and T2-FLAIR MR-regimens. Pathological accumulation of the paramagnetic isn’t taped after introduction of contrast (Figure 2 and 3).

At the same day the patient was evaluated by the endocrinologist and the diagnosis “The chronical autoimmune thyroiditis in the diffuse and nodal form with hypothyrosis” was determined. Nodal Struma on the right part. The blood tests results for thyroid gland hormones on the 18th day from the onset of the illness are shown in Table 1.

The steroid therapy was caused retrogradely of the neurologic symptoms. So the clinical picture, the disease development, the neuroimaging data and the electrophysiologic methods, the laboratory analyses data and the corticosteroid therapy response made HE diagnosis possible.

During survey when the patient was discharged from the hospital clear consciousness was apparent and the
patient was available for contact. The speech was without elements of aphasia nor dysarthria. When the patient was evaluated with the Mini-Mental State Examination the result was 28 points.

**Figure 2:** MRI of the Brain with Contrast Agent in a Sagittal Projection of the Patient with the Hashimoto’s Encephalitis, Executed on the 17th Day from the Beginning of a Disease Consider as a Normal Variant

The verbal short-term memory was normal. Meningeal signs were negative. The pupils were peer, photoreaction is alive. There was end-point horizontal nystagmus. The strength and the movements in extremities were unaffected. The tendon reflexes are slightly raised more on the left side. There was no pathological-foot sign. The sensivity examination was normal. The Rhomberg test was stable. The coordination tests carried out well.

We reported about the clinical case of the 44-year-old Caucasian woman, with HE (verified as a result of diagnostic process) in the form of tonic-clonic cramps. The patient was not informed that she suffered from a thyroiditis.

In the early terms from the beginning of implications (the 3rd day) the emergence of symptoms of partial motor and sensory forms of an aphasia with disturbance of the expressional speech, elements of a semantic aphasia, verbal paraphasias, an acalculia, depression of verbal short-term memory were noted. With the scale of MMSE (Mini-mental State Examination) the final result was 24 points –at the beginning of the disease, and 28 points after the installation of the correct diagnosis and treatment. The tendon reflexes (the biceps reflex, brachioradialis reflex, knee reflex) expressively raised at the left side, there is clonus of the left foot without decrease in muscular power of the left limbs. The treatment of herpes viral encephalitis as most probable disease within 10 days was carried out because the patient had IgG to herpes 1, 2 types. After verification of HE diagnosis and prescription of corticosteroids (Methylprednisolone in doses 1000 mg per day) the condition of the patient was considerably improved with retrograde of pyramidal, speech, cognitive symptoms and seizures. This case shows the need of differential diagnostics while taking into account the probability HE with combination of the seizures, the thyroidopathy, nonspecific focal neurologic symptoms.

But it is necessary to consider that HE, also known

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**Table 1:** The Thyroid Gland Hormones Level Laboratory Studies (The Dnipro Regional Clinical Hospital N.A. I.I. Mechnykov Laboratory)

<table>
<thead>
<tr>
<th>Studies</th>
<th>Value</th>
<th>Normal Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Free thyroxine (T4)</td>
<td>1.1 ng/mL</td>
<td>1.0-2.5 ng/mL</td>
</tr>
<tr>
<td>Free triiodothyronine (T3)</td>
<td>3.24 ng/mL</td>
<td>2.5-5.8 ng/mL</td>
</tr>
<tr>
<td>Thyroid-stimulating hormone</td>
<td>9.1 μU/mL</td>
<td>0.17-4.05 μU/mL</td>
</tr>
<tr>
<td>Antithyroid peroxidase</td>
<td>1126.98 IU/mL</td>
<td>up to 100 IU/mL</td>
</tr>
</tbody>
</table>

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**Figure 3:** MRI of a Brain with Contrast Agent in an Axial Projection of the Patient with the Hashimoto’s Encephalitis, Executed On the 17th Day from the Beginning of a Disease Consider as a Normal Variant
as a steroid dependent encephalopathy associated with an autoimmune thyroiditis (SREAT) can be the weakened reaction of a manifestation of SREAT which often is not diagnosed due to the lack of accurate diagnostic criteria. HE is characterized by features of autoimmune illnesses, found more often among women in comparison with the men [1, 9, 11]. It is represented by variable neurologic symptoms, augmentation of Antithyroid peroxidase and has a positive response to the corticosteroids therapy [1,12].

The examination and the treatment in terms up to 30 days of the 44 years old patient, Caucasian woman, with the verified Hashimoto’s encephalitis is conducted. The MRI of the brain with contrast agent in T1, T2, FLAIR conditions was performed. Also the neurophysiological methods of the computer electroencephalography (technique Medic-XAI), the ultrasonography of the thyroid gland, the determination of the hormone levels (thyroid-stimulating hormone) and the immunological status (antibody TPO, T3, T4) were used.

The assessment of combinations of a symptomatology and the probable correlations of these clinical researches with the neurologic status and the course of a disease was carried out.

**Conclusion**

For the first time developed seizure without the obvious reason in combination with a thyroidopathy which is followed by disturbance of the hormonal and immunologic status and development of the light neurologic, the neuropsychological symptoms mainly among the women of middle age, can be a manifestation of HE.

Taking into account the need of the exception for close conditions for diagnostics of the HE, the assessment of antiserum capacities of NMDA, GABA to receptors whose increase accompanies the autoimmune encephalitis more frequent at paraneoplastic processes is desirable.

Existence of the chronic autoimmune thyroiditis based on the structural changes of the thyroid gland and increase of Antithyroid peroxidase (1126.98, norm up to 100 IU/mL) with significant increase of the Thyroid-stimulating hormone level (9.1µU/mL; norm 0.17-4.05 µU/mL) and clinical assessment of values of Free thyroxine and Free triiodothyronine levels were accepted as confirmation of high probability of HE, taking into account the nature of changes of the central nervous system.

The focal changes of the brain and their localization were lightly expressed and considered as labile in the described case of HE. They settled mainly in the basal ganglia. And these changes were clinically characterized by disturbance of the highest cortical functions with speech, cognitive, pyramidal, paroxysmal disorders. During the standard computer EEG the patient had diffuse disorganization of rhythm (with deformation mainly in the pointed form, multiple sharp waves, and the periods of a theta activity pattern of EEG of epileptic character).

**Keywords**

Hashimoto’s Encephalitis; Seizure; Antithyroid Antibodies; Cognitive Violations

**References**

