

## CLINICAL CASE OF HYPOTHYROIDISM IN A PATIENT WITH AUTOIMMUNE THYROIDITIS

Shamitova E.N., Myasnikova I.A. Tuizarova. A.V., Alekseeva. A.V.

*Chuvash State University named after I.N. Ulyanova, Cheboksary, e-mail:irinatuizarova@mail.ru*

This article discusses a disease of autoimmune nature – Hashimoto hypothyroidism. It presents the clinical picture of the patient suffering from chronic autoimmune thyroiditis (AIT). The diagnosis was confirmed by biochemical blood tests for thyroid hormones. Patients with autoimmune thyroiditis often suffer from other autoimmune diseases of somatic and endocrine origin as well: diffuse toxic goiter, myasthenia gravis, infiltrative (autoimmune) ophthalmopathy, Sjogren's syndrome, alopecia, vitiligo, collagenoses, lymphoid cell hypophysitis. The onset of the disease can also be preceded by any effects leading to disruption in the integrity of the thyroid gland structure and penetration of thyroid antigens into the bloodstream (various infectious diseases, inflammatory processes, less often – thyroid injury or surgery on the thyroid gland. The factors that can trigger thyroiditis of an autoimmune nature can also be: environmental degradation, iodine deficiency or excess, radioactive contamination and others). Therefore, screening for hypothyroidism is conducted among individuals with adrenal insufficiency, patients with characteristic skin changes, vitiligo and alopecia, patients with arrhythmia, chronic heart failure, arterial hypertension, hypercholesterolemia.

**Keywords:** hypothyroidism, Hashimoto autoimmune thyroiditis, thyroid hormones

Hypothyroidism can have various causes. The autoimmune cause accounts for approximately 90% of adult hypothyroidism, mainly due to Hashimoto's disease. This disease was first described in 1912 by a Japanese doctor, a surgeon Hashimoto Hakaru in 4 patients with chronic thyroid disease. Histologically in autoimmune thyroiditis, lymphocytic infiltration, fibrosis of various degrees, parenchyma atrophy and eosinophilic changes in some acinar cells are observed.

The pathophysiology of an autoimmune thyroid disease over the past decades has been described in detail. Many thyroid antigens (thyroid stimulating hormone or TSH, thyroglobulin, thyroperoxidase) and antibodies have been identified. It has been established that autoantibodies, in particular, antibodies to thyroperoxidase and thyroglobulin, are produced during AIT [1].

The majority of patients with Hashimoto disease are women aged from 20 to 60, and almost 10% have obvious hypothyroidism. Among children, autoimmune thyroiditis occurs 2-6 times more often in girls than in boys [2].

The etiology of autoimmune thyroiditis is not clear. It combines genetic and environmental factors. Genetic factors dominate and affect about 80% of the onset of an immune response. Genetic predisposition is confirmed by the factor of association with some genes of HLA system (HLA-DR3, HLA-DR4, HLA-DR5 and HLA-DQA) and some non-HLA genes (T-lymphocyte 4-CTLA-4 antigen, CD40 gene, tyrosine phosphatase gene 22 -PTPN22, thyroglobulin and gene TSH). In 20% of cases, the etiology of Hashimoto thyroiditis is due to

environmental factors (smoking, selenium deficiency, pollution, infectious diseases, physical and emotional stress and iodine deficiency) and physiological conditions (puberty, rapid growth, pregnancy, menopause, aging, female sex). Although Hashimoto's thyroiditis has been known for many years, it is still occasionally met in surprisingly diverse clinical manifestations and often surprises many doctors [3].

The Chuvash Republic is a goiter-endemic region of the Russian Federation. In recent years, there has been an increase in the prevalence of multinodal (endemic) goiter associated with iodine deficiency, subclinical hypothyroidism, and AIT [4].

The prevalence of autoimmune thyroiditis per 100 thousand of population in Chuvashia tended to increase from 2011 to 2013. So, in 2011, the incidence of thyroiditis was 200.4 persons per 100 thousand of population, in 2012 – 206 persons per 100 thousand of population, in 2013 – 243.8 persons per 100 thousand of population. The incidence of endocrine disorders, metabolic pathologies among working age people in the administrative areas of the Chuvash Republic in 2014–2016 amounted to almost 300 persons (per 1 thousand of adult population). The leading positions in the frequency of these violations are taken by Yalchiksky (164), Krasnochetaysky (110), Poretsky (106), Kanashsky (79.9) regions [5].

The clinical picture of autoimmune thyroiditis depends on changes in the thyroid function. Clinical manifestations of this disease are usually detected along with hypothyroidism development.

Clinical hypothyroidism is a sign of permanent deficiency in thyroid hormones,

including modulation of calorigenesis (which results in hypothermia), decrease in oxygen consumption in most tissues and additional organ-specific effects. Disorders of protein metabolism lead to a slowdown in the synthesis and breakdown of proteins, impaired metabolism of glycosaminoglycans, accumulation of glycoprotein, mucin and hyaluronic acid in tissues. The excess of these substances changes the colloidal structure of the connective tissue, increases its hydrophilicity, sodium binding to sodium increases, generally causing myxedema formation. The mechanism of water and sodium accumulation in the tissues may also depend on excessive production of vasopressin, the synthesis of which is usually inhibited by thyroid hormones [1].

Symptoms and signs of primary hypothyroidism are often invisible and insidious. Symptoms may include chilliness, constipation, forgetfulness, and personality changes. A moderate weight gain is mainly the result of fluid retention and metabolism decrease. Paresthesias of the arms and legs are common, often due to carpal tunnel syndrome, caused by deposition of a protein base substance in the ligament around the wrist and ankle. Women with hypothyroidism can develop menorrhagia or secondary amenorrhea. Facial expression is boring; the voice is hoarse, and speech is slow; swelling of the face and periorbital edema are caused by infiltration of hyaluronic acid mucopolysaccharides and chondroitin sulfate; drooping eyelids are due to decreased sympathetic activity; the hair is thin, coarse and dry; and the skin is calloused and dry. The relaxation phase of deep tendon reflexes is slowed down. Hypothermia is noted. Dementia or overt psychosis may occur ("myxedema madness"). Often carotenemia is present which is especially noticeable on the palms and plantae, caused by deposition of carotene in lipid-rich epidermal layers. Deposition of a protein base substance in the tongue can cause macroglossia. Reduced hormonal and adrenergic stimulation of the thyroid gland causes bradycardia. The heart may appear enlarged during examination and imaging, partly due to dilation, but mainly due to pericardial effusion. Often there is effusion in the pleural and abdominal cavities. Pericardial and pleural effusions develop slowly and only in rare cases cause respiratory or hemodynamic distress syndrome.

In elderly patients, the symptoms of hypothyroidism are less pronounced than in young people, and the complaints are often vague. Many elderly patients with hypothyroidism have non-specific geriatric syndromes – con-

fusion, anorexia, weight loss, fallings, incontinence, and decreased mobility. Musculoskeletal symptoms (especially arthralgia) are common, but arthritis is rare. Muscle aches and weaknesses often imitate rheumatic polymyalgia or polymyositis. In older people, hypothyroidism can mimic dementia or Parkinsonism [6].

We present a clinical case. Patient M., 60 years old, born in the Kanashsky region of the Chuvash Republic, applied to a hospital in Cheboksary complaining of headaches, dizziness, noise in the head, poor coordination of movements, weakness, a feeling of "fog before the eyes", numbness of the fingers, coldness of the extremities, hoarseness, hair loss, dry mouth, dry skin, constipation, swelling of the face, feet, drowsiness.

Anamnesis. The patient considers herself to be ill during 6 months, when the above-mentioned symptoms appeared and began to progress. There was no outpatient examination. She denies having pathology of the internal organs.

An objective examination showed the general condition of moderate severity. The skin is pale, dry, of "parchment paper" type, the face is puffy, the lips are cyanotic. Pastosity of the legs and feet is marked. The thyroid gland is not palpable. In the lungs vesicular breathing with a frequency of 16 respiratory movements per minute is revealed, there is no wheezing. The heart sounds are muffled having a correct rhythm. The blood pressure is 100/70 mm Hg, D = S, the heart rate is 68 per minute. The abdomen is soft, painless. The liver is not enlarged. The body temperature is 36.7°C. The patient was emotionally irritable.

To verify the diagnosis, a number of studies were carried out.

According to biochemical studies, type IIA hyperlipidemia was observed with a total cholesterol level making 9.6 mmol/l (the normal values are 3.5-5.2 mmol/l), and low density lipoproteins 7.56 mmol/l (the normal values are 1.5-3, 5 mmol/l). Normally, triglycerides: 2.20 mmol/l (norm 0.50-2.30 mmol/l), HDL 1.12 mmol/l (norm 0.90-1.89 mmol/l). Elevated levels of alanine aminotransferase of 57.3 U/l (the norm is 1.0-45.0 U/l) and aspartate aminotransferase 82 U/l (the norm is 1.0-35.0 U/l) were observed. The rest of biochemical analyzes, including the level of electrolytes in the blood, were within the normal range. A blood test for thyroid hormones showed an increased level of thyroid stimulating hormone up to 31.00 mIU/l (norm 0.23 – 3.40 mIU/l), antibodies to thyroperoxidase 825.30 IU/ml (the norm is 0.00 – 30.00 IU/ml) and a reduced

level of free thyroxine (T4) 7.7 mmol/l (the normal values are 10.0 – 24.0 mmol/l). The remaining indicators for thyroid hormones were within normal limits.

The data of the brain magnetic resonance imaging showed a picture of multiple small focal changes in the white matter of the brain, most likely of a vascular nature.

The electrocardiogram results showed a sinus rhythm with a heart rate of 68 beats/min, deviation of electrical axes was not observed. Echocardiographic examination revealed the presence of atherosclerosis in the aorta, fibrosis of the mitral valve cusps with the first degree regurgitation on the mitral valve, an abnormal left ventricular cord.

According to the thyroid gland ultrasound examination, signs of diffuse changes in the thyroid gland of the AIT type with a decrease in the size of the thyroid gland to 7.3 cm<sup>3</sup> (the normal values are up to 18 cm<sup>3</sup>) were detected. The right lobe: the width is 13 mm, the thickness is 17 mm, the length is 36 mm. The left lobe: the width is 15 mm, the thickness is 13 mm, the length is 38 mm, the thickness of the isthmus is 2 mm. The echo was reduced; the structure was diffuse-heterogeneous. Color Doppler flow mapping showed that vascularization of thyroid tissue was within normal limits. In the structure of both lobes there were hypoechoic areas of 3 mm and 5 mm and hyperechoic strands. In the CFM, the vascular pattern was not enhanced. Regional lymph nodes were not enlarged.

According to the ultrasound examination of the mammary glands, no pathologies were detected, peripheral nodes were unchanged. During examination focal pathology was not detected in the projection of the adrenal glands.

The patient was consulted by an endocrinologist, diagnosed with chronic autoimmune thyroiditis (AIT), struma 0, symptomatic hypothyroidism.

It was recommended to take levothyroxine in the dose of 25 mcg in 1 tablet in the morning 30 minutes before meals, with condition was to be monitored, rosuvastatin 20 mg daily in the evening, cardiomagnyl 75 mg, indapamide retard 1.5 mg in the morning, losartan 50 mg daily in the morning under plasma lipid control, ALAT, ASAT, repeated blood tests for thyroid-stimulating hormone, free thyroxin in

6-8 weeks, as well as clinical follow-up by the district physician, a visit to the endocrinologist at the place of residence.

When examined by a dermatologist the patient was diagnosed with vulgar ichthyosis.

In view of the above data, a clinical diagnosis is made: Chronic autoimmune thyroiditis (AIT), struma 0, symptomatic hypothyroidism.

Concomitant diagnoses: Type IIA hyperlipidemia. Aortic atherosclerosis. Vulgar ichthyosis. Erosive duodenitis.

While taking Levothyroxine, the patient's condition improved, clinically weakness decreased, puffiness of the face and pastosity of the legs and feet were gone. The level of thyroid hormones, namely thyrotropic hormone and free thyroxin, was normalized as a result of treatment.

### Conclusion

The Chuvash Republic is an endemic area for thyroid diseases, in particular, hypothyroidism. The article presents a clinical picture of symptomatic hypothyroidism as the outcome of autoimmune thyroiditis in an elderly patient. The disease often develops slowly – this feature makes it difficult to diagnose, which was reflected in the description of this case. Lipid disorders in poorly compensated hypothyroidism, which occurred in our patient, carry a high risk of coronary artery atherosclerosis.

### References

1. Gosi SKY, Garla V.V. Subclinical Hypothyroidism. StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2018 Jan-30. PMID: 30725655 [PubMed] Free Books & Documents.
2. Leung AKC, Leung AAC. Evaluation and management of the child with hypothyroidism. World J Pediatr. 2019 Feb 8. doi: 10.1007/s12519-019-00230-w.
3. Gosi SKY, Garla V.V. Riedel Thyroiditis. StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2019 Jan-30.
4. Aizetullova G.R. (2015). Rezul'taty khirurgicheskogo lecheniya i kachestvo zhizni bol'nykh dobrokachestvennymi zabolevaniyami shchitovidnoi zhelezy v zobno-endemichnykh raionakh Chuvashskoi Respubliki. [Results of surgical treatment and life quality of patients with benign thyroid diseases in goiter-endemic regions of the Chuvash Republic]. Saransk. Extended abstract of Cand. Diss.
5. Krasnov V.M., Krasnov M.V., Golenkov A.V. (2012). [The current state of the problem of iodine deficiency in the Chuvash Republic and prevention of iodine deficiency diseases] in Vestnik Chuvashskogo meditsinskogo universiteta [Annals of the Chuvash Medical University]. № 3. P. 423–428 (in Russ.)
6. Wang Y., Zhou R., Wang J. Relationship between Hypothyroidism and Endometrial Cancer. Aging Dis. 2019 Feb 1;10(1):190-196. DOI: 10.14336/AD.2018.0224. eCollection 2019 Feb. Review.