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Treatment of hypothyroidism

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Abstract

Hypothyroidism is a deficiency of thyroid hormones or their insufficient activity. The most common cause of this disease is chronic autoimmune thyroiditis (Hashimoto's disease), iodine deficiency, partial or complete thyroid removal, and some medicines. Congenital hypothyroidism - may be primary or secondary to disorders of the pituitary gland or hypothalamus. The most common symptoms in the newborn are: prolonged jaundice, dry skin, constipation, umbilical hernia, large tongue, hypotonia, hoarseness, large bloated stomach. Hypothyroidism in pregnancy can lead to such complications as: preeclampsia, hypertension in pregnancy, spontaneous abortion, habitual abortion and even fetal death. It is important to recognize hypothyroidism and start treatment as early as possible. In the elderly, intensive treatment of subclinical and clinical hypothyroidism is not recommended. Treatment should be considered for people > 85 years of age with TSH level> 10 mIU/l, the usual indication for treatment are clinical symptoms.

Introduction

Hypothyroidism is a set of clinical symptoms resulting from a deficiency of thyroid hormones or their insufficient activity. The most common cause of this disease is chronic autoimmune thyroiditis (Hashimoto's disease), iodine deficiency, partial or complete thyroid removal, and some medicines - amiodarone, lithium, interferon α. Frequency increases with age, and is more common in people with other autoimmune diseases (type I diabetes, Addison's disease, myasthenia gravis, pernicious anemia, celiac disease, rheumatoid arthritis), or if these diseases occur in the family. The symptoms, diagnosis and treatment of this disease is varies depending on the age of the patient. Deficiency of thyroid hormones adversely affects the health, leading to many disorders and complications, sometimes irreversible, that is why it requires early diagnosis and appropriate treatment.

Hypothyroidism in childhood.

Congenital hypothyroidism - may be primary (most often it is a disorder in the development and migration of the thyroid gland or, more rarely, a disorder of thyroid hormone synthesis), or secondary to disorders of the pituitary gland or hypothalamus. Symptoms in the newborn may be not very characteristic and even not visible at the beginning because of increased permeability to thyroid hormones during the third trimester of pregnancy. The most common symptoms of hypothyroidism in the newborn include: prolonged jaundice, dry skin, constipation, umbilical hernia, large tongue, hypotonia, hoarseness, large bloated stomach. Hypothyroidism is the most common cause of mental retardation. From 1985 in Poland, in the first days of life, each child is screened - TSH from a drop of blood on a tissue paper. Currently, the correct result of TSH should not exceed 12 mIU/l, if it is higher and / or equal to 28 - it is considered as a positive result, values between 12-27 dubious test.

Acquired hypothyroidism - primary in children is usually autoimmune thyroiditis, iodine deficiency, drugs or damage to the postoperative gland; secondary - pituitary, hypothalamic tumors, postoperative or radiation damage of the pituitary or hypothalamus, histiocytosis X.

The basic laboratory tests for the assessment of hormonal disorders in the course of hypothyroidism is the determination of TSH, fT3 and fT4. In the pediatric population, TSH and fT4 levels depend on the age of:

from 3 days to 3 months	TSH (mIU/l)	0,16 - 12,56	ft4 (pmol/l)	8,9 – 33,1
3-12 months	TSH (mIU/l)	0,3 – 8,14	ft4 (pmol/l)	9,2 – 25,3
1-5 years	TSH (mIU/l)	0,53 – 6,57	ft4 (pmol/l)	9,0 – 34,7
5-10 years	TSH (mIU/l)	0,48 – 5,66	ft4 (pmol/l)	8,3 – 24,6
11-20 years	TSH (mIU/l)	0,32 – 6,54	ft4 (pmol/l)	7,0 – 31,5

Ultrasound is an indispensable element of diagnostics hypothyroidism. It allows to assess the thyroid's anatomy, its position, shows the structure of the parenchyma, echogenicity and vascular flow.

Treatment of hypothyroidism in children:

- overt hypothyroidism - levothyroxine in initial doses:

in newborns	10 - 15 µg / kg / 24 h (max 50 µg / 24h)
1- 6 months	8 - 10 mg/kg/24 h
6- 12 months	6 - 8 mg/kg/24 h
1– 5 years	5 – 6 mg/kg/24 h
6– 12 years	4 - 5 mg/kg/24 h
over 12 years	1-3 mg/kg/24 h

- subclinical hypothyroidism: doses lower than in overt hypothyroidism, beginning of fT4 supplementation when TSH> 10 mIU/l.

In children with TSH 5-10 mIU/l it is not needed to give L-thyroxine, if there isn’t a tendency to increase the level of TSH, the ultrasound of the gland is normal and when there is no increased level of antibodies.

Control tests of TSH and ft4 are carried out 4-6 weeks after each change of the dose of levothyroxine, up to 3 years of age. every 2-4 months, after 3 years every 3-12 months.

Method of administration - tablets should be crushed, dissolved in a small amount of water and give to a child using a spoon or syringe.

Hypothyroidism in pregnancy.

Pregnancy is a period in the life of a woman, in which the thyroid hormone needs increasing. It is important to recognize hypothyroidism and start treatment as early as possible because up to the 12th week of pregnancy the fetus does not release its own thyroid

hormones, and its sole source is the mother's thyroid. Hypothyroidism in pregnancy can lead to such complications as: preeclampsia, hypertension in pregnancy, spontaneous abortion, habitual abortion and even fetal death. However, subclinical hypothyroidism in pregnancy increases the risk of intrauterine growth inhibition. The secretion of thyroid hormones at the beginning of pregnancy is increased by 50%. The need for iodine also increases - it is recommended to take iodine with a diet of 250μg / day. The upper limit of the norm for TSH in pregnancy is I trimester - 2.5 mIU/l, II trimester - 3.0 mIU/l, III trimester 3.5 mIU/l. No increase in risk of fetal malformations when TSH in the first trimester was <4.5 mIU/l has been revealed. If the TSH is above the upper limit of normal for the corresponding trimester, the fT4 and anti-TPO tests should be performed. If the level of TSH is elevated and the level of antibodies is normal, a test for anti-TG and thyroid ultrasound should be performed. Proper treatment of hypothyroidism in pregnancy reduces the risk of complications to the level of risk in women with normal thyroid function. Treatment of hypothyroidism should be implemented as soon as possible after diagnosis. The dose is increased by 30-50% from the applied, control hormone tests should be ordered 6-8 weeks after dose adjustment, and then every 4 weeks after stabilization of TSH values. Women who have been diagnosed with hypothyroidism during pregnancy should be treated immediately with high doses of levothyroxine. In women with positive antithyroid antibodies, thyroid function should also be monitored after delivery, due to the increased risk of postpartum thyroiditis.

Subclinical hypothyroidism in pregnancy - treatment according to recommendation should be considered when TSH between 2.5 - 4 mIU/l with positive anti-TPO and TSH antibodies between 4 - 10 mIU/l with negative anti-TPO.

Hypothyroidism in adults

Hypothyroidism is the most frequent pathology of this gland. It occurs in the general population in about 5%, five times more often among women, the risk of disease increases after 75 years of age. Overt hypothyroidism can be diagnosed if the TSH level is elevated, usually above 10 mIU/l and the lowered fT4 level. The correct level of TSH is between 0.45 mIU/l and 4.15 mIU/l. The most common symptoms are: weight gain, cold and dry skin, constipation, hyperkeratosis, weakness of the heart rate, mononeuropathies, menstrual disorders in women, infertility, miscarriages, muscle weakness, fatigability, depression, memory disorders. The American Thyroids Association recommends screening for women

and men over 35 years of age every 5 years, on the other hand the Royal College of Physicians of London does not recommend testing a healthy population.

The treatment is chronic, starts with low doses of L-thyroxine 25-50 μg, which increases every 2-4 weeks. The target maintenance dose is 1.6 μg/kg per day, for older people 1 μg /kg per day. Measurement of TSH levels after dose adjustment should be performed after 4-6 weeks. It should be taken on an empty stomach, 60 minutes before breakfast, washed down with water. It is also possible to take the drug 4 hours after the last meal. After setting the dose and obtaining euthyreosis, it is recommended to measure TSH once every 6-12 months. The therapeutic goal is the level of TSH in the range of 0.4 - 2.5 mIU/l.

In subclinical hypothyroidism (TSH level 2.5 - 4.5 mIU/l, and fT4 within the normal range), no treatment with L-thyroxine is recommended without clinical signs. It is recommended to treat patients <65 years of age when TSH> 10mIU/l without clinical symptoms or when TSH <10 mIU/l and clinical symptoms appear. If, after 3-4 months of normalizing TSH levels, there is no reduction in symptoms, discontinuation of treatment should be considered.

In the elderly, intensive treatment of subclinical and clinical hypothyroidism is not recommended. Treatment should be considered for people > 85 years of age with TSH level> 10 mIU/l, the usual indication for treatment are clinical symptoms, high risk of a cardiovascular event. The dose is increased cautiously, 25 μg/day every 2-3 weeks. After normalization of the TSH level, the control test should be performed 1-2 times a year. Intensive treatment may lead to an increased risk of fractures, atrial fibrillation, neurological and psychological disorders. The goal of treatment should be to maintain the level of TSH in the range of 1-5 mIU/l.

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