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A MODERN VIEW ON PRIMARY PREVENTION OF HYPOTHYROIDISM

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Relevance: Hypothyroidism is an endocrinological disease that manifests itself as insufficient production of thyroid hormones. There are three degrees of the disease: primary, secondary and tertiary hypothyroidism in women and men. Hypothyroidism is one of the most common diseases of the endocrine system. Despite the well-studied etiology, pathogenesis and simple diagnosis, in some cases the disease remains unrecognized for a long time, which is due to the slow increase in thyroid deficiency and, accordingly, the severity of the clinical picture. The biological action of thyroid hormones is very diverse: by activating the transcription of numerous genes, they participate in the regulation of basic physiological processes in the body, therefore their deficiency can manifest itself in a wide variety of clinical manifestations and symptoms and imitate diseases of almost all body systems [1]. Among diseases of the endocrine system, hypothyroidism is the second most common after diabetes mellitus. The difficulty of diagnosing hypothyroidism lies in the diversity and non-specificity of symptoms. This is due to the fact that thyroid hormones have an effect on almost all organs and systems. At the same time, the severity of manifestations of thyroid insufficiency can be different and does not always correlate with the severity of laboratory changes. The clinical picture of a patient with hypothyroidism may present multiple symptoms, which makes diagnosis difficult, especially in elderly and multimorbid patients [2]. Thyroid hormone (T3) – triiodothyronine plays a critical role in metabolism and organ physiology, and thyroid disease is one of the most common types of metabolic disorders. Hypothyroidism syndrome is perhaps the most common pathology of the endocrine system. Thyroid dysfunction is one of the leading endocrine diseases. Previous data shows that about half of the population with thyroid dysfunction remains undetected. The pattern of thyroid dysfunction appears to depend on the iodine status of the population. The prevalence of thyroid dysfunction may be a parameter to consider when assessing iodine deficiency diseases in a population. European estimates place its prevalence at 5% of the population. However, up to 5% of people may have undiagnosed thyroid hormone deficiency. Deficiency or excess of T3 in humans results in abnormal metabolic rates and adversely affects the physiological functions of many organs such as the heart and liver [3]. Hypothyroidism is a deficiency of thyroid hormones in the body.Based on pathogenesis, hypothyroidism is divided into primary and secondary. Most often, primary hypothyroidism develops in adults; the cause of its development in most cases is chronic autoimmune thyroiditis, less often resection of the thyroid gland, radioactive iodine therapy and a number of other factors. In these conditions, as a rule, a persistent, irreversible deficiency of thyroid hormones develops. Secondary hypothyroidism develops very rarely. The reasons for its development are, as a rule, various destructive processes in the hypothalamic-pituitary region. Most often these are macroadenomas of the pituitary gland and suprasellar structures, as well as surgical interventions or radiation for these diseases. The prevalence of manifest hypothyroidism in the population is about 2%, but in certain age groups it can reach 6–8%. The highest prevalence of primary hypothyroidism is in older women. According to one of the

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large population studies, in a group of women aged 18–24 years, hypothyroidism was detected in 4%, among women over 74 years old in 21% of those examined, the same pattern can be seen in men: if among men 18–24 years old the prevalence hypothyroidism was 3%, then in the population over 74 years old – 16% [4]. Secondary hypothyroidism is a clinical syndrome that develops as a result of insufficient production of thyroid-stimulating hormone in the absence of primary pathology of the thyroid gland itself, which could lead to a decrease in its function. In contrast to primary hypothyroidism, secondary hypothyroidism is diagnosed equally often in both men and women; its prevalence in the population, according to various sources, varies from 1: 16,000 to 1: 100,000 population, depending on age and etiology [1, 2]. There are congenital and acquired forms of secondary hypothyroidism [3]. The prevalence of this pathology according to neonatal screening in the Netherlands is 1: 16,000, in Japan and Indiana (USA) 1: 160,000 newborns [4–6]. This significant difference can be explained by the fact that in Japan and the USA the screening program includes determination of TSH and T4 concentrations, while in the Netherlands the interpretation of the TSH/T4 ratio was carried out taking into account the content of thyroxine-binding globulin [5].

The aim of the study: The purpose of the study is to study the prevalence of hypothyroidism among the population, its course, to study the frequency of occurrence of hypothyroidism, prognosis, prevention and the impact of the thyroid gland on the functioning of other systems and organs. Diagnosis of hypothyroidism is based on an assessment of the clinical picture and data from laboratory and instrumental research methods. Laboratory testing of serum TSH and thyroid hormone levels is fundamental in diagnosing decreased thyroid function. The main role is given to the determination of thyriotropic hormone by highly sensitive methods [6].

Materials and research methods: The study included a group of 78 people without ultrasound evidence of thyroid enlargement, changes in thyroid echogenicity, or nodules. Study participants were given a series of laboratory tests to create reference values for a healthy population. The sample did not include persons under 12 years of age with goiter, those receiving medications that affect the thyroid gland, and pregnant women. In addition, patients taking sex hormones, lithium, and those who had elevated antibodies to the thyroid gland were excluded. The process of making a diagnosis was determined by collecting complaints, anamnesis, examining the patient, palpation of the thyroid gland. An ultrasound examination of the thyroid gland was performed to determine the size and structure of the gland and visualize the nodes. Tests were prescribed: a complete blood count, an analysis of the level of thyroid-stimulating hormone in the blood, the level of T3, T4 in the blood. One of the most important indicators in diagnosing hypothyroidism is a blood test to determine whether there are disorders of the thyroid gland and whether it produces hormones correctly. Tests for hypothyroidism can determine the level of thyroid-stimulating hormone, T4 and free T4, total T3 and free T3, and thyroid autoantibodies. blood test for thyroid hormones: T3, T4, thyroid-stimulating hormone, ultrasound examination of the thyroid gland. Hypothyroidism is a condition in which the thyroid gland does not produce enough hormones such as thyroxine (T4) and triiodothyronine (T3). Since these hormones play an important role in metabolic processes, a decrease in their levels has a negative impact on health. The laboratory diagnosis of hypothyroidism is based on determining the level of thyroid-stimulating hormone and free thyroxine in the blood. The main significance in this case is given to the level of thyroid-stimulating hormone. Determination of free T4 is optional and etermination of triiodothyronine is not advisable. The detection of an isolated increase in the level of thyroid-stimulating hormone with a normal level of free T4 indicates subclinical hypothyroidism, and a

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simultaneous increase in the level of TSH and a decrease in free T4 indicates obvious, or manifest, hypothyroidism. Thus, with the gradual development of hypothyroidism, the level of thyroid-stimulating hormone initially increases, as the most sensitive indicator of thyroid function [4].

Research results: When analyzing the data obtained from studies in a group of participants, the upper limit for thyroid-stimulating hormone was 4.7 m/l. Ultrasound of the thyroid gland determined a decrease in the volume of the gland in 58%, compactions with clear boundaries in 2%, an enlargement of the thyroid gland in 4% of those studied. When collecting anamnesis from the subjects, the most common complaints were weakness and fatigue in 78%, apathy in 47%, constant drowsiness during the day and insomnia at night in 21%, unreasonable weight gain in 52%, dryness and sagging skin in 41%, hair loss in 37 %, frequent constipation 43%, loss of appetite in 47%.

Menstrual irregularities in 19% of women. decreased libido in men - 14%, and in women - 21%. Thyroid hormones regulate the rate of metabolic processes in the body, change the activity of the adrenergic system, affect peripheral vascular resistance, enhance glycogenolysis and glycogenesis with specific contrainsular activity. Thyroid-stimulating hormone is the main marker for diagnosing hypothyroidism; reference intervals for this hormone are important in determining treatment tactics [7]. Thyroid-stimulating hormone secretion is primarily regulated by negative feedback from thyroid hormones. In this regard, the statement that thyroid-stimulating hormone is the only sufficient marker for assessing thyroid function during a screening examination can be questioned.

It seems appropriate to identify among patients a group at risk of developing secondary hypothyroidism [4,8]. Hypothyroidism can cause complications in the functioning of a number of systems, which leads to serious complications.

Thyroid hormones support metabolic processes in our body. A change in their concentration in the blood leads to digestive disorders and disrupts the functioning of the cardiovascular and nervous systems. They can significantly reduce the quality of life of a child and an adult. The most common symptoms of hypothyroidism include: decreased sweating, hoarseness, paresthesia, dry skin, constipation, hearing loss, weight gain, slower movements, roughening of the skin, periorbital edema, cold skin. The main difficulty in diagnosing hypothyroidism is due to the non-specificity of symptoms, which significantly complicates the timely diagnosis of the disease. Clinical assessment scales for hypothyroidism symptoms have been discussed in the literature at various times, but none of them have become widely used in clinical practice. Thus, in one of the population studies, a questionnaire was used consisting of questions regarding the 14 most common symptoms of hypothyroidism. The results showed that patients with overt hypothyroidism had any symptoms more often than patients with subclinical hypothyroidism. However, about 30% of patients with manifest hypothyroidism did not present any complaints, and patients with euthyroidism in 20% of cases noted the presence of 4 or more complaints [4,7,9]. In the clinical picture, a patient with hypothyroidism may present a variety of symptoms from various organs and systems, which makes diagnosis difficult, especially in elderly and multimorbid patients. Also, patients often experience a predominance of symptoms from one system, and therefore there is a concept of diseases - “Masks” of hypothyroidism. There are cardiac masks (diastolic hypertension, dyslipidemia, hydropericardium), gastroenterological (constipation, cholelithiasis, hepatitis), rheumatological (polyarthritis, polysynovitis, osteoarthritis), dermatological (alopecia, hyperkeratosis, onycholysis), psychiatric (dementia and depression), gynecological (infertility,

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menstrual irregularities), hematological (anemia) [3,8]. Due to such a variety of clinical manifestations, a patient with hypothyroidism may find himself seeing a doctor in almost any specialty or simultaneously being observed by several different specialists. In this regard, any doctor should remember the likelihood of hypothyroidism in the patient, know the features of damage to organs and systems with a decrease in thyroid function [6,9].

Conclusion: Thyroid hormones affect the functioning of all human organs and systems. Therefore, thyroid deficiency manifests itself in a wide variety of nonspecific symptoms. A thorough, detailed history will help identify combinations of various diseases, which will help to suspect hypothyroidism as the cause of multimorbidity and examine the patient to confirm this preliminary diagnosis [2,8]. With timely detection and proper treatment, hypothyroidism has a favorable prognosis. Hormone replacement therapy allows you to maintain normal levels of thyroid-stimulating hormone, T4 and T3 and live a normal life without restrictions. Early treatment of congenital hypothyroidism prevents damage to the central nervous system, so the child can develop normally. Prevention of hypothyroidism includes: proper, balanced nutrition, including fish and seafood, giving up bad habits, regular physical activity, frequent walks in the fresh air, annual preventive examination, refusal of self-medication, and periodic spa treatment.

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