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MODERN ASPECTS OF DIAGNOSTICS OF AUTOIMMUNE DISEASES OF THE THYROID GLAND

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Conflict of interest
The authors declare that they have no conflicts of interest

Keywords:
autoimmune thyroiditis, diagnostic algorithm, needle biopsy

Abstract

Objective.*This research is meant to study the features of the clinical course and to develop an optimal algorithm for the diagnosis of autoimmune thyroid diseases.*

Material and methods.*The work is based on the examination and treatment data of 481 patients with autoimmune diseases of the thyroid gland, treated in the clinic. Diagnosis and treatment results of 481 patients were analyzed to develop an optimal algorithm for diagnosing autoimmune thyroiditis.The differential diagnostic capabilities of clinical, laboratory, and morphological examination methods of patients with autoimmune thyroid diseases have been specified.The study of long-term results of treatment was carried out on 340 patients, taking into account the various methods of treatment they underwent.*

Results.*The analysis of existing diagnostic tools and methods allowed us to develop an optimal algorithm for diagnosing autoimmune thyroid diseases, which is a complex of clinical, laboratory, and morphological methods that can reliably verify the diagnosis of autoimmune thyroiditis. Based on the examination results, it is possible to predict the likelihood of surgical treatment and to identify a group of patients in whom autoimmune processes can progress in the thyroid residue, contributing to the development of postoperative recurrence of the disease or causing its atrophy.*

Conclusion. *Based on the study's results, a rational algorithm for diagnostic search has been developed. The proposed algorithm allows, in the shortest possible time, to identify the presence of a form of autoimmune thyroid disease and to determine the optimal tactics to treat patients with autoimmune thyroiditis based on clinical, laboratory, immunological tests and instrumental examinations.*

Қалқанша безінің аутоиммунды ауруларының диагностикасының заманауи аспектілері

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аутоиммунды тиреоидит, диагностикалық алгоритм, ине биопсиясы.

Аңдатпа

Мақсаты. *Клиникалық курстың ерекшеліктерін зерттеу және аутоиммунды қалқанша безінің ауруларын диагностикалаудың оңтайлы алгоритмін құру.*

Материал және әдістер. *Жұмыс қалқанша безінің аутоиммунды аурулары бар науқастарды тексеру және емдеу деректеріне негізделген, клиникада 481 науқас емделген. Аутоиммунды тиреоидит диагностикасының оңтайлы алгоритмін жасау үшін 481 науқастың диагностикасы мен емдеу нәтижелері талданды. Қалқанша безінің аутоиммунды аурулары бар науқастарды зерттеудің клиникалық, зертханалық және морфологиялық әдістерінің дифференциалды диагностикалық мүмкіндіктері нақтыланды. 481 науқастың 312-сінде (64,9%) пункциялық биопсия жүргізілгенде, 39 (12,5%) науқаста қалқанша без тінінің жасушаларының атипия және қатерлі ісік белгілері анықталды. Емнің ұзақ мерзімді нәтижелерін зерттеу 340 (70,7%) науқаста жүргізілген әртүрлі емдеу әдістерін ескере отырып жүргізілді.*

Нәтижелер. *Қолданыстағы диагностикалық құралдар мен әдістерді талдау аутоиммунды тиреоидит диагнозын сенімді түрде тексеруге болатын клиникалық, зертханалық және морфологиялық әдістер кешені болып табылатын аутоиммунды қалқанша безінің ауруларын диагностикалаудың оңтайлы алгоритмін жасауға мүмкіндік берді. Тексеру нәтижелері бойынша хирургиялық емдеу ықтималдығын болжауға болады, сондай-ақ аутоиммундық процестер қалқанша безінің қалдығында ілгерілеуі мүмкін, бұл аурудың операциядан кейінгі қайталануының немесе аурудың қайталануының дамуына ықпал ететін науқастар тобын анықтауға болады. оның атрофиясын тудырады.*

Қорытынды. *Зерттеу нәтижелері бойынша диагностикалық іздеудің рационалды алгоритмі жасалды. Ұсынылған алгоритм мүмкіндігінше қысқа мерзімде аутоиммунды қалқанша безінің ауру түрін анықтауға және клиникалық, зертханалық, иммунологиялық зерттеулер мен аспаптық зерттеулер негізінде аутоиммунды тиреоидитпен ауыратын науқастарды емдеудің оңтайлы тактикасын анықтауға мүмкіндік береді.*

Современные аспекты диагностики аутоиммунных заболеваний щитовидной железы

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Аннотация

Цель. *Изучение особенностей клинического течения и разработка оптимального алгоритма диагностики аутоиммунных заболеваний щитовидной железы.*

Материал и методы. *Работа основана на данных обследования и лечения больных аутоиммунных заболеваний щитовидной железы, лечившихся в клинике 481 больного. Для разработки оптимального алгоритма диагностики аутоиммунного тиреоидита проанализированы результаты диагностики и лечения 481 больного. Уточнены дифференциально-диагностические возможности клинических, лабораторных и морфологических методов обследования больных аутоиммунными заболеваниями щитовидной железы. Пункционная биопсия, проведенная у 312 (64,9%) из 481 больного, выявила у 39 (12,5%) пациентов признаки атипии и малигнизации клеток щитовидной ткани. Изучение отдаленных результатов лечения проведено у 340 (70,7%) больных с учетом перенесенных ими различных методов лечения.*

Результаты. *Анализ существующих средств и способов диагностики позволил разработать оптимальный алгоритм диагностики аутоиммунных заболеваний щитовидной железы, который представляет собой комплекс клинических, лабораторных и морфологических способов, позволяющих достоверно верифицировать диагноз аутоиммунного тиреоидита. На основании результатов обследования можно прогнозировать вероятность проведения хирургического лечения, а также выделить группу больных, у которых в тиреоидном остатке могут прогрессировать аутоиммунные процессы, способствующие развитию послеоперационного рецидива болезни или вызывающие его атрофию.*

Заключение. *На основании полученных результатов исследования разработан рациональный алгоритм диагностического поиска. Предложенный алгоритм позволяет в наиболее кратчайшие сроки выявить наличие формы аутоиммунных заболеваний щитовидной железы, и определить оптимальную тактику лечения больных аутоиммунным тиреоидитом на основании клинических, лабораторных, иммунологических тестов и инструментальных обследований.*

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Конфликт интересов
Авторы заявляют об отсутствии конфликта интересов

Ключевые слова:
аутоиммунный тиреоидит, алгоритм диагностики, пункционная биопсия

Introduction

According to the literature data, the frequency of autoimmune thyroid diseasesis 25-35% among all thyroid diseases and ranks second after diabetes among endocrinological diseases. Most often, autoimmune thyroid disease affects women aged 25-65 years. The clinical picture of autoimmune thyroid diseases is determined by the severity and prevalence of pathomorphological changes in the thyroid gland [1,2].

The available literature lacks data on the clinical course and a rational algorithm for the diagnostic data of patients with autoimmune thyroid disease. Despite studies on the main pathogenetic mechanisms, the diagnostic criteria and morphological changes in the thyroid gland in autoimmune thyroiditis are still not clear enough [3,4]. Autoimmune thyroiditis (AIT) is a typical representative of autoimmune diseases, characterized by immune inflammation of the thyroid gland. A characteristic morphological sign of AIT is lymphoplasmacytic infiltration of the thyroid tissue of the gland with obligatory autoimmune inflammation. The diffuse form of AIT occurs in approximately 40-60% of patients. The composition of cells in AIT is always constant; it combines cells of the lymphoid series, plasmacytic infiltration, and macrophages [1,2].

Meanwhile, in practice, the clinical diagnosis in medical institutions is often formulated as nodular (or multinodular) goiter. However, from a practical point of view, the identification of the main forms of autoimmune thyroid diseases is extremely important, since the use of an accurate classification will clearly establish the nature of the clinical course of the disease (with complications/ without complications), give an objective assessment of the prognosis of the disease, therefore, choose the optimal method of treating the disease. We must not forget that patients with autoimmune thyroid diseases have a higher risk of developing “thyroid cancer” than people who do not suffer from this disease [5,6].

In most cases, cytological examination of the punctate nodular formation of the thyroid gland allows you to determine the nature of the node. However, it is not always possible to verify the diagnosis of autoimmune thyroid diseases by cytological signs. Sometimes thyrocytes of benign follicular neoplasia by morphological characteristics do not allow reliable differentiation of a benign tumor - follicular adenoma

- from follicular carcinoma cells [7,8,9]. These same facts significantly complicate the identification of pathological changes in cells in autoimmune thyroiditis. Sometimes the term "follicular tumor" unites all nodular formations in the thyroid gland, including those formed against the background of AIT. In practice, we can talk about a benign tumor - follicular or microfollicular adenoma, often combined with autoimmune thyroiditis, so increasing the sensitivity and specificity of methods for diagnosing autoimmune thyroid diseases is important from the point of view of further treatment tactics for this category of patients [10,11].

The issue of early diagnosis of autoimmune thyroid diseases remains unresolved today since the disease has a subclinical course at the initial stage. Unfortunately, none of the research methods allows you to establish an accurate diagnosis. On the basis of anamnestic, clinical, and laboratory data (a decrease in the level of thyroid hormones, the presence of high titers of antithyroid antibodies in the blood) and an ultrasound examination of the thyroid gland, a diagnosis of autoimmune thyroiditis is established [12,13]. An important place in the diagnosis of autoimmune thyroiditis is occupied by ultrasound (ultrasound), as it provides the patient with ease of examination, painlessness, and safety. Despite all these advantages, the method still does not allow differentiating AIT from a number of other diseases. In addition, autoimmune thyroiditis can be combined with colloid goiter, so thyroid ultrasound can be considered an auxiliary method in the diagnosis of autoimmune thyroid diseases. Ultrasound gives us data on the size, localization, shape, anatomical and topographic relationships of the gland with other organs [14,15].

Currently, doctors have clinical, instrumental, laboratory, and morphological methods in their arsenal for diagnosing autoimmune thyroid diseases. At the same time, the variety of clinical variants of autoimmune thyropathies, the lack of a generally recognized morphological classification of the disease, often atypical symptoms of the disease, and its early stage are factors that can lead to diagnostic errors and incorrect treatment tactics [16,17].

Further research on the problem of diagnosis and treatment of autoimmune thyroid diseases should be directed towards the development of a clear algorithm for diagnosing AIT using modern diagnostic tools and methods, as well as a reasonable approach to choosing the optimal method of treating autoimmune thyroid diseases, taking into account the individual characteristics of the patient. Thus, the increase in the incidence of the disease, the difficulties and lack of effectiveness of existing diagnostic methods, and the conflicting opinions of researchers in the approaches to the diagnosis and treatment of patients with autoimmune thyroid diseases indicate the urgency of the problem.

Purpose of the study

To study the features of the clinical course and to develop an optimal algorithm for the diagnosis of autoimmune thyroid diseases.

Material and methods

The work is based on the examination and treatment data of patients with autoimmune diseases of the thyroid gland treated at the clinic. For the period from 2008 to 2021, 481 patients aged 27 to 73 years were examined. Examination and treatment results of patients were analyzed to develop anoptimal algorithm for diagnosing autoimmune thyroid diseases. The differential diagnostic capabilities of clinical, instrumental, laboratory, and morphological examination methods of patients with autoimmune thyroiditis have been specified. Puncture biopsy performed in 312 (64,9%) of 481 patients revealed signs of atypia and malignancy of thyroid cells in 39 (12,5%) patients. All 39 patients were diagnosed with a hypertrophic form of autoimmune thyroiditis. The study of long-term results of treatment was carried out on 340 (70,7%) patients with autoimmune thyroid diseases. Patients were followed up for 1 to 5 years or more.

The algorithm for laboratory examination of patients with autoimmune thyroid diseases includes traditional tests: clinical blood count, general urinalysis, biochemical blood test, and blood electrolytes. Determination of thyroid status and the level of autoantibodies to antigenic structures of the thyroid tissue was carried out by measuring the concentration of thyroid hormones (free T_3, free T_4),TSHand antibodies to thyroid tissues Anti-TG, Anti-TPO in the blood serum of patients with enzyme immunoassay method.

In order to clarify the nature and extent of damage to the peripheral vascular bed of the thyroid gland, all patients, without exception, underwent ultrasound research methods, including ultrasound duplex angioscanning, color Doppler mapping, and visualization in the color Doppler energy mode.

During the cytological study, we studied the quantitative composition of cells using the morphometry method. In cytological preparations, an analysis of the quantitative composition of neutrophils, macrophages, lymphocytes, fibroblasts, and other cells was carried out. To assess the effectiveness of the treatment, a fine-needle aspiration puncture biopsy (FNAB) was performed with cytological examination before the start of photodynamic therapy (PDT), and then on days 5, 10, and 30 after treatment. The biological preparation was fixed in Carnoy's fluid for 2 hours and embedded in paraffin. Sections 5-7 μm thick were stained by Papanicolaou. Histological examination was performed according to the standard method on paraffin sections stained with hematoxylin and eosin, picrofuchsin according to Van Gieson.

Statistical Analysis.The obtained digital data were subjected to statistical processing by methods of medical statistics. All calculations were carried out on the EXCEL-2016 and SPSS-24 spreadsheet. To assess the statistical significance of differences in the frequencies of the studied characteristics, a nonparametric χ^2 test was used. Differences were considered statistically significant at $p<0,05$. In each group of patients, the relative values of the analyzed parameters, their mean error (m), 95% confidence interval (±2m), and the significance of intergroup differences were calculated.

Results

The conducted retrospective study consists of 4 stages. At the outpatient (first) stage of the study, subclinical symptoms of autoimmune thyroid diseases were identified. Subjective data (anamnesis, complaints, intensity of clinical symptoms and syndromes, patient's assessment of quality of life) and objective data were analyzed to assess the presence or absence of signs of autoimmune thyroid diseases. The second stage was confirmation of the diagnosis of autoimmune thyroid disorders based on clinical and anamnestic data. Particular attention was paid to the data of ultrasound of the thyroid gland, cytological examination of punctates, and data of immunological, immunohistochemical, and histological studies of patients. The study of the cardiovascular system was carried out in all patients and included electrocardiography (ECG), if necessary, ABPM (24-hour blood pressure monitoring), echocardiography (EchoCG), and stress echocardiography. Based on clinical data, instrumental studies, and hormonal status, a complete clinical diagnosis of the disease was established. The third stage of the study is devoted to choosing optimal treatment tactics for autoimmune thyroid diseases based on a comparative analysis of the treatment results of patients with autoimmune thyroiditis.

In order to study the clinical and morphological features of autoimmune thyroid diseases and evaluate the clinical effectiveness of the treatment, a comparative analysis of subjective and objective data was performed to assess the presence or absence of signs of subclinical or overt hypothyroidism (intensity, manifestations, and severity of symptoms of the disease).

At the last stage of the study, the results of monitoring 442 (91,9%) patients who received various types of treatment in the clinic were analyzed. Long-term results of treatment were studied in 340 (70,7%) patients. According to the results of instrumental, laboratory, and morphological studies, a diagnostic search algorithm has been developed.

To assess the condition of patients in each of the three groups, we took into account a number of clinical symptoms and signs that were detected in patients during long-term follow-up. We studied the incidence of these syndromes in each of the three groups of patients (Figure1).

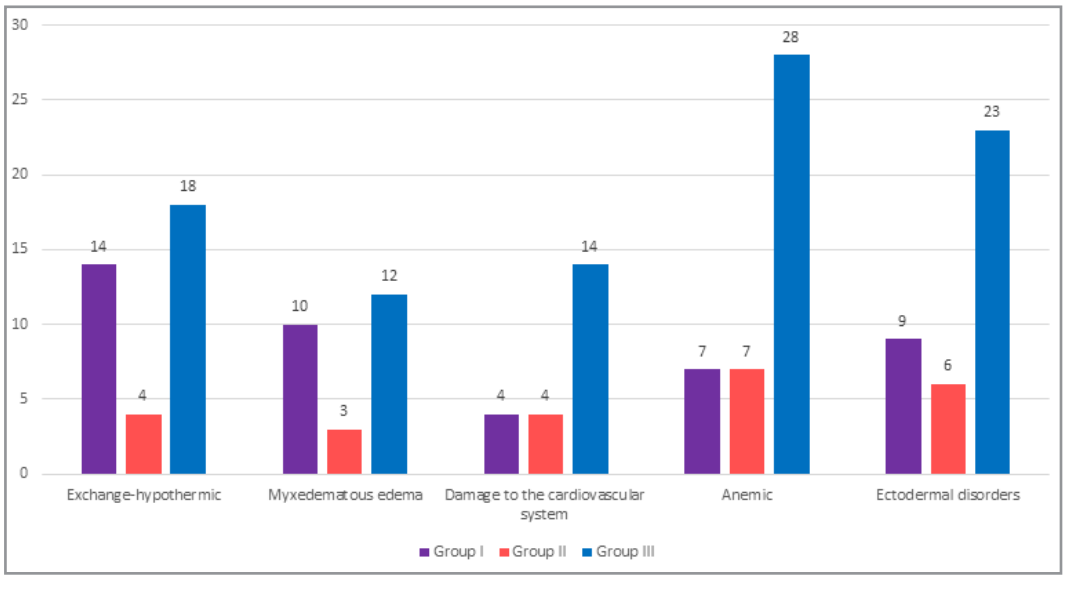

Figure 1.
The frequency of clinical syndromes in three groups of patients with autoimmune thyroid disease in the long term after various types of treatment

Analysis of the obtained data allowed us to note that among the total number of treated patients, hypothyroidism was detected in 101 (29,7%) of 340 patients followed. It should be emphasized that the number of patients with hypothyroidism is less than those who have certain clinical syndromes of hypothyroidism since two or more syndromes of this condition were observed in the same patient. In a comparative assessment of patients' conditions in groups, it was found that clinical signs of hypothyroidism were most often detected in people who underwent surgery - 62 (39,5%) of 157 patients followed. Among patients of group II, hypothyroidism was encountered with a lower frequency in 14 (17,5%) out of 80 patients followed, and among patients of group I, hypothyroidism was encountered in almost every fourth patient followed up in the long term - 25 (24,3%) out of 103 people. All patients with symptoms of hypothyroidism received maintenance therapy throughout the entire observation period.

Attention is drawn to the data on the nature of concomitant diseases that were detected in patients with autoimmune thyroid disease during examination in the clinic. A rather high incidence of comorbidities should be noted: hypertension in 250 (51,9%) and coronary heart disease in 226 (47,0%) patients. Diabetes mellitus, obesity, and chronic diseases of the gastrointestinal tract were diagnosed in every third patient. Diseases of the genitourinary and hematopoietic systems were detected least often. Most patients had a combination of two or more comorbidities. As a rule, this combination was accompanied by dysfunction of a number of important organs and systems and, in turn, affected the choice

of treatment tactics and the treatment results for patients.

The assessment of the quality of life showed that with adequately conducted conservative therapy, including substitution therapy, it remains at a satisfactory and good level in most patients. When assessing the quality of life, we used a questionnaire using a numerical 10-point scale, where the number 1 means “Absolutely dissatisfied”; 10 - “Very satisfied”; 5 - “Satisfied”; 0 - “Difficult to answer” in case of difficulty in answering the question. From the data in table 1, the majority of patients (290 (85,3%) out of 340 in all three groups) assess their quality of life as satisfactory or very good (Table 1).

Table 1.
Assessment of the quality of life in three groups of patients, taking into account the methods of treatment

Groups of patients	Number of patients	Score			
		1	5	10	0
I	103 (30,3%)	19 (18,4%)	60 (58,3%)	17 (16,5%)	7 (6,8%)
II	80 (23,5%)	7 (8,8%)	49 (61,3%)	20 (25,0%)	4 (5,0%)
III	157 (46,2%)	7 (4,4%)	94 (59,9%)	47 (29,9%)	9 (5,7%)
Summary of data	340 (100%)	33 (9,7%)	203 (59,7%)	84 (24,7%)	20 (5,9%)

Statistical processing of the data presented in table 1 using Pearson’s χ^2 method showed no significant difference in indicators between patients of groups I, II, and III in terms of overall scores: calculation separately for each score revealed the following values: by score - 1. Pearson’s χ^2 =10,4, p=0,025; by score - 5. χ^2=0,16, p=0,99; by score - 10. χ^2=6,0, p=0,05; by score - 0. χ^2=0,27, p=0,99; according to the joint assessment of points - 5. and 10. χ^2=10,9, p=0,025.

Currently, the main way to monitor and control the state of the thyroid residue in operated patients is ultrasound. In 202 operated patients, an analysis was made of the data of dynamic ultrasound examination, which was performed 1-3, 6-8, 12-14, 24-25 months after the operation. Residual thyroid tissue was found in 106 (52,4%) of 202 patients. In the remaining 96 people, the thyroid remnant could not be visualized: in 93 examined patients after thyroidectomy, in 1 (2,4%) of 42 followed-up patients after extremely subtotal resection of the thyroid gland, and in 2 (3,0%) of 67 followed-up patients after subtotal resection of the thyroid gland. thyroid resection. During dynamic monitoring of 106 patients in whom thyroid tissue was visualized. In operated patients, the hypertrophic type of change in the volume of the thyroid residue was most common - this variant was noted in 38 (35,8%) of 106 examined patients. An important criterion characterizing the state of the thyroid homeostasis system is the period of stabilization of the volume of the thyroid residue and the normalization of its structure (ultrasound examination of the parenchyma of the gland appears homogeneous and isoechoic, with normal vascularization). Stable throughout the entire period of observation, the volume of the thyroid residue was in 13 (12,3%) people. After 6-8 months. after surgery, his parenchyma was homogeneous and had normal vascularization in 3 (23,0%) patients.

To assess the state of hormonal homeostasis of patients in the late periods after treatment, we studied the concentration of thyroid hormones in a total of 150 patients, divided into three groups based on the treatment methods performed. According to the data presented in table 2, it can be noted that in each of the three groups of patients, hypothyroidism signs were observed (Table 2).

Table 2.
The concentration of thyroid hormones in the thyroid gland in the three groups in the late periods of observation

Groups of patients	Thyroid hormone levels		
	TSH mIU/ml n(0,27-4,2)	FT_4pmol/L n (12,0-22,0)	FT_3pmol/L n(3,1-6,8)
Igr.(n = 50)	6,4 [3,71-8,46]	8,9 [4,28-11,5]	2,1 [1,62-4,43]
IIgr.(n = 50)	5,7 [2,05-6,27]	9,4 [6,41-12,43]	2,8 [1,83-4,51]
IIIgr.(n = 50)	7,2 [4,25-9,15]	6,7 [3,92-10,13]	1,9 [1,24-2,87]

TSH: Thyroid-stimulating hormone; FT_4: Free thyroxine; FT_3: Free triiodothyronine

If in patients of group II these signs were not pronounced according to laboratory parameters and in mostpatientsthey corresponded to subclinical hypothyroidism, then in patients of groups I and III these signs are quite pronounced and were determined in high TSH levels and low levels of T_4 and T_3. In other words, if patients of group II showed signs of subclinical hypothyroidism with greater frequency, then in patients of groups I and III, deeper and more pronounced signs of clinical hypothyroidism were more

often observed. Analysis of the obtained data indicated that postoperative hypothyroidism was observed in all patients who underwent subtotal resection of the thyroid gland and thyroidectomy and in almost 1/3 of patients (32%) who received traditional conservative treatment. Given the presence of such changes, in fact, in every patient in all three groups of patients, we prescribed replacement therapy with levothyroxine. A study of the quality of life of patients showed that with adequate replacement therapy, it practically does not change.

The data shown in table 3 indicate that after 6-8 months, antibody titers are closest to normal in patients of group III, who underwent surgical treatment, and in patients of group II, who received photodynamic therapy in combination with sessions of intravenous laser blood irradiation with low-intensity laser radiation (ILBI-LILR) and conservative therapy. The slowest recovery of cellular immunity was observed in patients who received a course of conservative therapy in combination with sessions of ILBI-LILR (Table 3).

Antibody titer	I group 129 people examined		II group 106 people examined		III group 202 people examined	
	Anti-TG	Anti-TPO	Anti-TG	Anti-TPO	Anti-TG	Anti-TPO
Undetected	58 (45,0%)	39 (30,2%)	11 (10,4%)	32 (30,2%)	59 (29,2%)	162 (80,2%)
Low	38 (29,5%)	77 (59,7%)	64 (60,4%)	61 (57,5%)	120 (59,4%)	40 (19,8%)
High	33 (25,6%)	13 (10,1%)	31 (29,2%)	13 (12,3%)	23 (11,4%)	0

Table 3.
Indicators of antibody titer to TG and TPO in patients with autoimmune thyroiditis in the long term after the use of various methods of treatment

Anti-TG: anti-thyroglobulin; Anti-TPO: anti-thyroid peroxidase

With statistical processing of the data presented in table 3 used Pearson's χ^2 test. A statistical difference is observed between groups I, II, and III due to the indetermination of the Anti-TG titer (respectively, I and II - χ^2=73,1, p≤0,001; I and III χ^2=8,6, p≤0,010; II and III χ^2 =8,6, p≤0,010; II and III χ^2=14,0, p≤0,010). Due to the uncertainty of the titer of Anti-TPO, there are no statistical differences between group I and group II (χ^2=0, p≥0,050); Group III was statistically significantly different from groups I and II (χ^2=82,3, p≤0,001). Group Iisstatistically different from II (χ^2=22,6, p≤0,010) and III (χ^2=27,0, p≤0,010) groups in terms of low levels of Anti-TG titer, and there is no statistical difference between groups II and III (χ^2=0, p≥0,050). According to the low level of Anti-TPO, group III statistically significantly differs from group I (χ^2=54,0, p≤0,001) and II (χ^2=44,7, p≤0,001). There was no statistical difference between groups I and II (χ^2=0, p≥0,050).

According to the definition of a high level of Anti-TG titer, the indicators of group III are statistically significantly different from groups I and II (respectively, χ^2=11,1, p≤0,010; χ^2=15,3, p≤0,010). There was no statistical difference between groups I and II (χ^2=0,36, p≥0,050). There was no statistical difference in determining a high level of Anti-TPO titer between groups I and II (p>0,050).The study of the cellular link of immunity in patients with AIT showed that the most pronounced changes were observed in the population of T-lymphocytes, manifested by a change in the number of cells in subpopulations and a violation of their ratio. Studies have shown that an adequately performed operation in combination with a properly performed replacement therapy contributes to the normalization of immune parameters in most patients.

The need for immunological monitoring to assess the effectiveness of preoperative preparation and postoperative management of patients with autoimmune thyroiditis is confirmed by the fact that the appointment of an adequate dose of levothyroxine improves cellular immunity. Subsequent immunological examination showed a decrease in the titer of antibodies to thyroid peroxidase and thyroglobulin. Therefore, based on the data of the immunological examination, it is possible to judge the adequacy of the postoperative preparation and surgical treatment performed, as well as to identify a group of patients in whom autoimmune processes can progress in the thyroid residue, contributing to the development of postoperative recurrence of the disease or causing its atrophy.

Discussion

The available literature lacks data on the clinical course, a rational algorithm for the diagnostic data of patients with autoimmune thyroiditis. Despite the study of the main pathogenetic mechanisms, the diagnostic criteria and morphological changes in the thyroid glandduring AIT are still not clear enough. In order to study the clinical and morphological features of autoimmune thyroiditis and evaluate the clinical effectiveness of the treatment, an analysis of subjective and objective data was performed to assess the presence or absence of signs of subclinical or overt hypothyroidism. Based on the results of the study, we proposed a rational algorithm for diagnostic search. The developed algorithm is used in our clinic, which allows us to detect the presence of complications in the shortest possible time and determine the optimal tactics for treating patients with autoimmune thyroiditis.

Analysis of the data of clinical, instrumental, laboratory, and morphological studies suggests that in patients with diffuse nodular and diffuse pseudonodal forms of AIT, a complicated course of the disease is more often observed. For these forms, the characteristic features are the growth and enlargement of the thyroid gland. The progression of the disease leads to changes in the structure of the thyroid

gland, in which goiter changes occur (multiple foci of lymphoid and plasmacytic infiltration are formed), and locally a goiter (nodular or multinodular) is formed. In addition, clinically the disease is manifested by the development of overt hypothyroidism. We observed a similar course of the disease in 68,2% of patients with the diffuse-nodular form of AIT. In patients suffering from diffuse and atrophic forms of AIT, the clinical picture of the disease differs from that described. Complications in the form of goiter formation are rare, but hypothyroidism develops in these patients quite often. In our observations, such a course of the disease was detected in 20,3% of patients.

The limitations of the study include the lack of a single protocol dedicated to the problem of diagnosis and treatment of AIT. Despite the widespread prevalence of autoimmune thyroiditis and a long history of conservative therapy, the effectiveness of adequate treatment of AIT is relevant to this day. The disadvantage of the existing known drug therapy is its low efficiency, as well as the possibility of complications and recurrence of the disease. It is promising to create combined methods for the treatment of patients with diffuse autoimmune thyroiditis using laser photodynamic therapy and intravenous blood irradiation, which makes it possible to increase the effectiveness of the treatment by shortening the onset of a qualitative improvement in their condition, as well as reducing the number of complications and preventing the development of hypothyroidism.

Perspective directions for further research on the problem of diagnosis and treatment of AIT are developing a clear algorithm for the treatment of AIT using modern methods of treatment and studying the dynamics of the quality of life in patients with autoimmune thyroiditis.

Conclusions

1. The personalized approach to the diagnosis and treatment of patients with autoimmune diseases of the thyroid gland provides for the application of a complex of sequential actions in the form of the use of informative methods of diagnosis for the verification of the diagnosis (Fig. 1). The application of this algorithm allows you to determine the form of autoimmune diseases of the thyroid gland, the nature of its course, the characteristics of pathological changes in the thyroid gland, in neighboring organs and tissues, to exclude the tumor process and to choose a rational method of treating the patient.

2. The conducted analysis of clinical symptoms, ultrasound and morphological examination of patients with autoimmune diseases of the thyroid gland allows, with a high degree of reliability, to establish a precise diagnosis of the disease using a complex of modern diagnostic methods, which should represent an algorithm of actions.

3. Based on the results of the research, a rational algorithm for diagnostic search is developed. The proposed algorithm allows, on the basis of clinical, laboratory, immunological tests and instrumental examinations, to detect the presence of autoimmune thyroid diseases in the shortest possible time and to determine the optimal treatment tactics for patients with autoimmune thyroiditis.

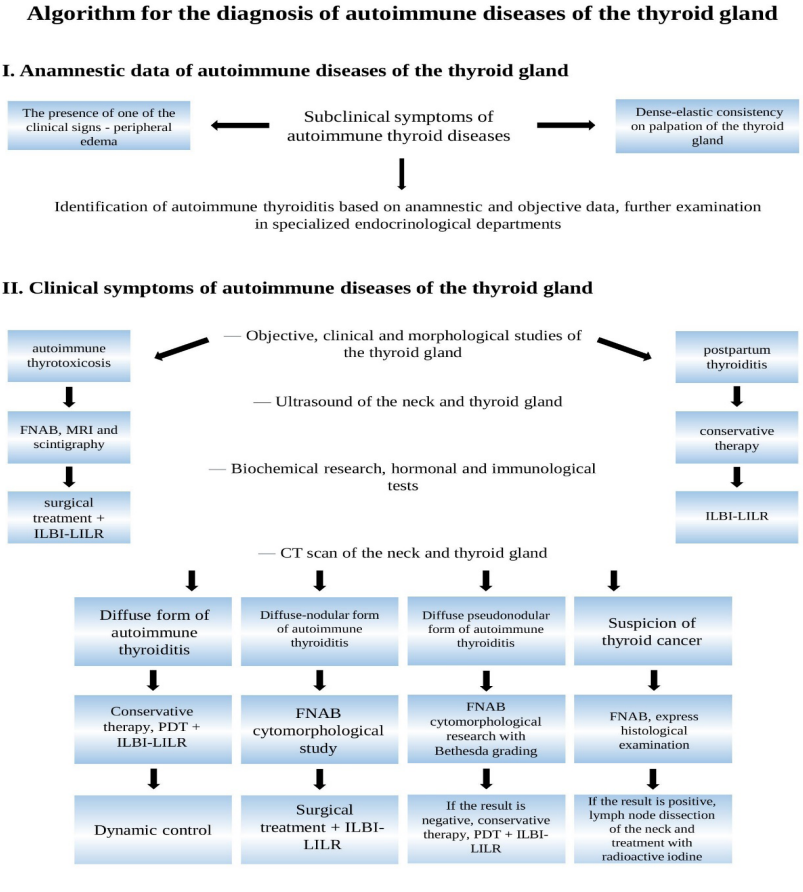

Figure 1.
Algorithm for the diagnosis of autoimmune diseases of the thyroid gland.
ILBI: intravenous laser blood irradiation;
LILR: low-intensity laser radiation;
PDT: photodynamic therapy;
FNAB: fine-needle aspiration puncture biopsy;
MRI: Magnetic resonance imaging;
CT: computed tomography

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