RCMOS - Multidisciplinary Scientific Journal The Knowledge.
ISSN: 2675-9128. São Paulo-SP.

Year VII, v.1 2026 | Submission: 05/15/2026 | Accepted: 05/18/2026 | Publication: 05/21/2026

Therapeutic strategies applied to Hashimoto's thyroiditis

Therapeutic strategies applied to Hashimoto's thyroiditis

Therapeutic strategies applied to Hashimoto's thyroiditis

Emily Gabriele de Almeida Souto [1] Dr.
Jhones do Nascimento Dias [2] 1-Student

of Biomedicine at the Higher Education Institute of Brasília- IESB 2-Professor Doctor of Biomedicine at the Higher Education Institute of Brasília- IESB

ABSTRACT

Introduction: Hashimoto's thyroiditis is a chronic autoimmune disease affecting the thyroid gland, compromising the production of thyroid hormones and frequently leading to hypothyroidism. This study aims to analyze the main evidence-based therapeutic strategies for the clinical management of this condition, considering its pathophysiological, diagnostic, and therapeutic aspects. Methodology: This was a literature review conducted in the PubMed, Google Scholar, and SciELO databases, including articles published from 2021 onwards, in Portuguese and English. Results: The results show that levothyroxine hormone replacement therapy remains the standard treatment, being effective in normalizing hormone levels and controlling symptoms. In addition, nutritional and supplemental interventions, such as the use of selenium, zinc, iron, and vitamins, have potential as adjuvant therapies, especially in modulating the immune response and improving thyroid function. The discussion reinforces the multifactorial nature of the disease, involving genetic, environmental, and immunological factors, and highlights the importance of an integrated therapeutic approach.

Final considerations: It is concluded that the combination of pharmacological treatment, nutritional strategies, and control of environmental factors can provide more effective and individualized management of Hashimoto's thyroiditis, contributing to improved quality of life for patients.

Descriptors: Hashimoto's thyroiditis; hypothyroidism; diagnosis; treatment; autoimmunity.

1. INTRODUCTION

The thyroid is an endocrine gland essential for the proper functioning of the body, responsible for...
production of the hormones T3 (triiodothyronine) and T4 (thyroxine), which regulate metabolism, the
growth and development. Structurally, it is formed by follicles filled with colloid.
Rich in thyroglobulin (a precursor protein for thyroid hormones), essential for synthesis.
Hormonal. Its proper functioning ensures metabolic balance, influencing organs such as
the heart, muscles, liver, and nervous system, in addition to maintaining body temperature and energy expenditure.
energy (Mansur et al., 2025).
Hashimoto's thyroiditis stands out as one of the main diseases affecting this gland.
characterized as an autoimmune condition. In this disease, the immune system begins to...
produce antibodies against thyroid components, such as thyroglobulin (precursor protein)
hormonal) and thyroid peroxidase (an enzyme essential for the production of T3 and T4 hormones), leading to
Progressive destruction of thyroid cells. This process involves both the humoral response.

RCMOS - Multidisciplinary Scientific Journal The Knowledge.
ISSN: 2675-9128. São Paulo-SP.

Year VII, v.1 2026 | Submission: 05/15/2026 | Accepted: 05/18/2026 | Publication: 05/21/2026

Regarding cellularity, it initially results in enlargement of the gland (goiter), followed by atrophy and loss.
of function (Roller et al., 2023).

As a consequence of this destruction, there is a reduction in the production of thyroid hormones, leading to
to hypothyroidism (insufficient production of these hormones), the main clinical manifestation of
disease. Among the most common symptoms are fatigue, weight gain, cold intolerance, and skin problems.
Dryness, hair loss, and constipation. Early diagnosis is crucial to prevent them.
complications and improve the quality of life of patients, since the disease has a slow progression.
and progressive (De Carvalho et al., 2022).

The diagnosis of Hashimoto's thyroiditis is based on clinical evaluation, combined with tests.
Laboratory tests, such as measuring TSH (thyroid-stimulating hormone, produced by the pituitary gland) and free T4.
(free thyroxine, available active fraction) and antithyroid antibodies (especially anti-TPO —
Antibody against thyroid peroxidase). In the initial stages, hormonal changes may occur.
transient, but in advanced stages, an increase in TSH and a reduction in hormones are observed.
Thyroid disorders. Imaging tests, such as ultrasound, are also important for evaluation.
Structural changes in the gland and complementary investigation (De Carvalho et al., 2022).

The standard treatment consists of hormone replacement therapy with levothyroxine (a synthetic form of T4).
Administered continuously to compensate for thyroid hormone deficiency. The therapy should
It should be individualized and monitored through laboratory tests. Furthermore, factors such as the form...
The administration of the medication and its interactions with other nutrients or substances should be considered.
considered to ensure its effectiveness (Fernandes et al., 2024).

Finally, complementary approaches, especially nutritional ones, have gained prominence in
Disease management. Micronutrients such as selenium, zinc, iron, and vitamins play a role.
Important in thyroid function and in modulating the immune system. Environmental factors,
Genetic factors and lifestyle habits also influence the development and progression of the disease. Thus,
Treatment of Hashimoto's thyroiditis requires an integrated approach, targeting not only the underlying causes of the condition.
hormonal control, but also to the improvement of the patient's overall health and quality of life (Mansur
et al., 2025).

The aim of this study is to conduct a literature review on therapeutic strategies.
Based on evidence for Hashimoto's thyroiditis, addressing its effects in an integrated way.
fundamentals, pathophysiology and autoimmune mechanisms, as well as describing the main methods
clinical and laboratory diagnostic tools used in the identification and monitoring of the disease, in addition
to critically evaluate the scientific evidence of the different therapeutic approaches available,
highlighting its benefits, limitations, recent advances, and perspectives for the clinical management of this
condition.

RCMOS – Multidisciplinary Scientific Journal The Knowledge.
ISSN: 2675-9128. São Paulo-SP.

Year VII, v.1 2026 | Submission: 05/15/2026 | Accepted: 05/18/2026 | Publication: 05/21/2026

2. METHODOLOGY

This is an integrative literature review, the search for which was carried out in the PubMed database.
Google Scholar and SciELO. The inclusion criteria adopted included original articles,
Published from 2020 onwards, written in Portuguese or English, and available in at least [languages/platforms].
one of the databases mentioned that addressed aspects related to pathogenesis, to
Studies that did not address the diagnosis and management of Hashimoto's thyroiditis were excluded from the analysis.
They met the objectives of the review, such as case reports, duplicate articles, and publications outside the scope of the methodology.
established period or that presented themes inconsistent with the main focus of
search.
The search strategy used the Health Sciences Descriptors (DeCS): "Hashimoto's
"thyroiditis", "diagnosis", and "treatment", combined by the Boolean operator "AND", in order to
to increase the sensitivity and accuracy of the results. In the initial stage, identification and
the screening of studies, with the elimination of duplicates, followed by a careful reading of the titles and
Abstracts, to which the previously defined inclusion and exclusion criteria were applied.

3. RESULTS

A search of the Virtual Health Library, Google Scholar, and PubMed databases identified
18,607 articles. After applying filters, removing duplicates, and subsequent sorting steps.
(titles, abstracts, language, availability of full text, methodological quality and relevance)
(clinical), 10 studies were selected to comprise the final corpus of the analysis. (Figure 1)

Figure 1. Flowchart of article selection.

RCMOS – Multidisciplinary Scientific Journal The Knowledge.
ISSN: 2675-9128. São Paulo-SP.

Year VII, v.1 2026 | Submission: 05/15/2026 | Accepted: 05/18/2026 | Publication: 05/21/2026

Among the 10 articles selected for this review, several diagnostic criteria were analyzed and Immunological parameters relevant to Hashimoto's thyroiditis. The central axes of the investigation. They understood the diagnostic protocols, treatment modalities, and evidence. Scientific studies concerning the cure or clinical control of the pathology. Details of the evaluated articles are available. available in Table 1 (information on title, authors, year of publication, objective and results).

Table 1. Characteristics of the selected scientific archives, according to title, authors, year of publication, the objective and results.

Title	Authors:	Target Year	Results
Controlling autoimmune thyroiditis: cellular immunomodulation through MSCs. Tregs and tolDCs	PENG *et al.*	2026: Explore new therapies using special cells to treat Hashimoto's thyroiditis, since current treatments only replace hormones and do not stop the immune system's attack on the thyroid.	The results indicate that the use of stem cells, regulatory T cells, and dendritic cells can "recalibrate" the body's defenses. These cells can inhibit aggressive inflammation and protect the thyroid, promoting a natural rebalancing that prevents tissue destruction. Although technical challenges remain for large-scale use, these therapies represent real hope for treating the immunological cause of the disease.
Hashimoto's disease: advances in the treatment and management of autoimmune hypothyroidism	MACEDO *et al.*	2025 Conduct an integrative review of therapeutic advances and new management strategies for Hashimoto's thyroiditis, focusing on overcoming the limitations of conventional treatment and discussing therapeutic individualization and the effectiveness of adjuvant therapies.	Gold standard: LT4 is effective in normalizing TSH in >85% of cases. In some cases, auxiliary therapies such as selenium and myo-inositol help control autoimmunity. Personalization: Genetics and technology are the keys to treating symptoms that persist even with normal test results.
Hashimoto's thyroiditis: clinical, metabolic aspects and nutritional intervention	MANSUR *et al.*	2025 Explore the mechanisms that cause the disease, the forms of treatment and, especially, the importance of multidisciplinary care that is not limited to medication, also considering the psychological and nutritional impact on the patient.	Therapeutic efficacy: standard treatment with levothyroxine is effective, but nutritional support (selenium and specific diets) contributes significantly to antibody control. Psychosocial impact: there is a strong association between the disease and disorders such as anxiety and depression. Holistic approach: the success of the treatment depends on a multidisciplinary team (doctors, nutritionists and psychologists).
Hashimoto's disease: an integrative literature review	ASSAD; RESENDE; BUENO	2023 Understanding how the disease works (pathophysiology), how it manifests in patients, current forms of treatment, and, most importantly, the impact it has on people's emotional health and quality of life.	It has been shown that the disease requires multidisciplinary care (doctor, nutritionist and psychologist) to ensure a good quality of life, since it affects both the body and the emotional sphere.
Hashimoto's thyroiditis as a prevalent etiology of primary hypothyroidism: etiopathogenic aspects, methods	DE CARVALHO *et al.*	2022 Consolidate updated scientific information (research from 2018 to 2022) on Hashimoto's thyroiditis, explaining how the disease develops.	Hashimoto's thyroiditis is leading cause of hypothyroidism in Brazil — An autoimmune disease in which the body attacks its own thyroid gland. Diagnosis depends on...

RCMOS – Multidisciplinary Scientific Journal The Knowledge.
ISSN: 2675-9128. São Paulo-SP.

Year VII, v.1 2026 | Submission: 05/15/2026 | Accepted: 05/18/2026 | Publication: 05/21/2026

Title:	Authors	Year	Objective :	Results
Diagnosis and therapeutic approaches			How should it be diagnosed and what are the best forms of treatment currently available?	Association between clinical symptoms and TSH, free T4, and anti-TPO test results. Levothyroxine replacement therapy is highly effective. It is effective when started early, although some patients have residual symptoms even with normal tests.
Hashimoto's thyroiditis: an evidence-based guide to etiology, diagnosis, and treatment.	KLUBO-GWIEZDZI ÿSKA; WARTOFSKY	2022	Describe the autoimmune origin of the disease, explaining how genetic and environmental factors cause the destruction of the thyroid; inform about the different clinical phases and highlight specific risks for pregnant women, as well as the relationship with tumors.	An autoimmune condition with a significantly higher prevalence in women, diagnosed by anti-TPO antibodies, which can increase the risk of gestational complications. Management focuses on hormone replacement therapy in cases of functional thyroid insufficiency, with continuous monitoring due to the high risk of thyroid cancer.
Nutritional management of Hashimoto's thyroiditis	DANAILOVA *et al.*	2022	Present and discuss the challenges associated with the nutritional management of Hashimoto's thyroiditis, focusing on environmental factors, dietary deficiencies, inflammatory and toxic nutrients, and the roles of vitamin D and melatonin. in preserving thyroid function during chronic inflammation.	Hormone replacement therapy with levothyroxine is essential, but a proper diet and a healthy lifestyle complement the treatment and promote remission by improving thyroid function and regulating TSH, T3, T4, and antibodies. Adherence to nutritional guidelines—an anti-inflammatory diet and controlled vitamin D intake—is also crucial. It can reduce the need for medication, slow the progression of the disease, and prevent relapses.
Stem cell therapy for thyroid diseases: progress and challenges	YE; ZHU	2022	Review the therapeutic applications of stem cells in the thyroid.	In addition to embryonic and mesenchymal stem cells, organ-resident stem cells and cancer stem cells have been identified as important in the formation of organ-specific cells and in the development of cancer. Mesenchymal stem cells, in particular, have anti-inflammatory and anticancer functions.
Simulation model for autoimmune thyroiditis disease Hashimoto	SALAZAR-VIEDMA *et al.*	2021	To describe and understand the interactions between different cells of the immune system (TH1, TH17 and Treg lymphocytes) and the gut microbiota in the development of the disease, using a mathematical model that simulates these interactions.	The model demonstrated that thyroid destruction occurs due to a systemic imbalance. Cellular attack: TH1 and TH17 increase inflammation and cause the death of thyrocytes. Gut connection: dysbiosis reduces the number of Treg cells, paving the way for TH17 cells to attack the gland more intensely. Crucial factor: the development of the disease depends on the balance between aggressive immune activity and the health of the microbiota.
Thyroid-gut axis: how does the microbiota influence thyroid function?	KNEŽEVIÿ *et al.*	2020	Investigate the axis gut-thyroid, analyzing how the composition of the gut microbiota influences the development of autoimmune diseases. (Hashimoto and Graves), the	Dysbiosis increases intestinal permeability, allowing toxins to activate the immune system against the thyroid. Nutrition: A healthy gut is vital for the absorption of iodine, selenium, zinc, and iron.

Year VII, v.1 2026 | Submission: 05/15/2026 | Accepted: 05/18/2026 | Publication: 05/21/2026

Title	Authors	Year	The goal is	Results
			to diagnose thyroid cancer and ensure the absorption of essential nutrients by the gland.	Supplementation: Probiotics have been shown to be effective in improving thyroid function. Personalized treatment: the microbiome should be considered in treatment, allowing for more specific preventive strategies.

3. DISCUSSION

Analysis of the selected studies shows that Hashimoto's thyroiditis (HT) is not just a malfunction.
of the gland, but rather the result of a complex interaction between genetic predisposition and triggers.
Environmental factors that lead to the loss of immune self-tolerance. The main basis of the disease.
It resides in the chronic inflammation of the thyroid gland, which presents increasing infiltration of lymphocytes.
(Antero et al., 2024).

In terms of pathophysiology, the disease progresses through slow and persistent damage to the
tissues. Continuous damage to the thyroid follicles leads to the replacement of functional parenchyma.
by fibrous tissue, resulting in a decreased ability to synthesize T3 and T4 hormones.
Clinically, this progression is observed in stages: from a euthyroid state to hypothyroidism.

Subclinical hypothyroidism occurs when TSH levels rise to try to compensate for the gland's deficiencies, eventually leading to the development of hypothyroidism.

Severe clinical signs. As already mentioned in the literature, this destruction cannot be reversed in most cases.
of the cases; this justifies the need for treatment with levothyroxine to restore balance.
patient's metabolic rate (Antero et al., 2024).

The autoimmune mechanisms of HT are supported by an imbalance in cellular immunity.
involving mainly TH1 and TH17 lymphocytes. These defense cells, in a state of
Hyperactivity releases pro-inflammatory cytokines that trigger apoptosis of thyrocytes.
Simultaneously, there is a failure or reduction of regulatory T cells (Treg), which are responsible for inhibiting
This aggressive response. This scenario is aggravated by systemic factors, such as intestinal dysbiosis,
which increases the permeability of the mucosal barrier and activates immune pathways that exacerbate the attack on
gland, which reinforces the multifactorial and integrated nature that should guide current clinical management.

This integrative review compiled ten recent studies (2020–2026) on thyroiditis.
Hashimoto's disease, encompassing pathophysiological, diagnostic, and therapeutic aspects. The results obtained
They show strong alignment with contemporary literature, reinforcing already established trends and
highlighting emerging perspectives in the management of this autoimmune condition.

The findings indicate that levothyroxine remains the gold standard treatment for
Hypothyroidism resulting from Hashimoto's thyroiditis, being effective in normalizing levels.

Year VII, v.1 2026 | Submission: 05/15/2026 | Accepted: 05/18/2026 | Publication: 05/21/2026

Serum TSH levels were elevated in a large proportion of patients. This finding is consistent with what...
Macedo et al. (2025) describe this, pointing to a satisfactory response rate of over 85%.
Data analyzed in the selected studies corroborate this evidence and reinforce the need for
continuous and individualized monitoring, as suggested by De Carvalho et al. (2022).
In addition to hormone replacement therapy, the results were consistent with published findings.
recent studies highlighting the role of immunological and environmental factors in the development of
disease. The mathematical model presented by Salazar-Viedma et al. (2021), identified in the corpus
Finally, it demonstrates that an imbalance in the gut microbiota intensifies the autoimmune response.
corroborating the conclusions of Knezevic et al. (2021). This body of evidence reinforces the role
The increasing role of the gut-thyroid axis as a relevant pathophysiological element.
Another aspect that stands out in the literature and in the results analyzed refers to the strategies.
Complementary nutritional values. Micronutrients such as selenium, zinc, iron, and vitamin D are
frequently cited for their ability to modulate the inflammatory response and reduce levels
of antithyroid antibodies, as discussed by Mansur et al. (2025). The included studies
This review confirms the effectiveness of these adjuvant approaches, especially when combined with...
conventional treatment.

New therapies, especially the use of stem cells and T cells that regulate the immune response, are emerging.
and dendritic cells that help induce tolerance, were seen as good options for the
treatment of the disease in the future. According to Peng et al. (2026) and Ye and Zhu (2022), these
Interventions can act directly on the immunological cause of Hashimoto's thyroiditis, unlike
of the current treatments that only compensate for the hormonal consequences of thyroid dysfunction.
Although still in the experimental phase, they represent a major step in the search for solutions.
curative.

The results obtained have important implications for clinical practice. Replacement with
Levothyroxine, while effective, may not be sufficient for all patients, which reinforces the...
need for complementary approaches that consider nutritional, emotional and
Microbiological. The adoption of specific supplements and anti-inflammatory diets can help.
to reduce antibody levels and improve residual symptoms, in accordance with the
most recent literature.

In theoretical terms, the findings reinforce the understanding of Hashimoto's thyroiditis as a
A multifactorial condition that requires treatments that go beyond simple hormone replacement.
incorporating new perspectives, such as the study of the microbiome and the development of therapies
immunomodulators, indicates an important shift in the scientific perspective that is increasingly approaching
more about personalized therapy.

Year VII, v.1 2026 | Submission: 05/15/2026 | Accepted: 05/18/2026 | Publication: 05/21/2026

Finally, future research should invest in robust clinical studies that evaluate the effectiveness of complementary therapies, such as probiotics and micronutrients, and explore biomarkers capable of to anticipate the diagnosis. Furthermore, it is necessary to advance the development and validation of... Cell therapies, ensuring safety and effective clinical applicability. These approaches can to contribute to a more complete and effective treatment capable of meeting the different needs of patients with Hashimoto's thyroiditis.

FINAL CONSIDERATIONS

The literature review presented allowed us to understand that Hashimoto's thyroiditis (HT) goes Beyond a simple hormonal deficiency, it constitutes a complex disease with multiple causes. Although treatment with levothyroxine remains the best method for normalizing blood levels Regarding TSH and free T4, the analyzed data shows that this solution, by itself, often does not... It is sufficient to reduce inflammatory symptoms and improve the overall quality of life of patients. The results show that an integrative approach is fundamental to the success of the treatment. Modulation of the gut microbiota through the thyroid-gut axis, combined with supplementation. A strategic intake of micronutrients, such as selenium, zinc, and vitamin D, was effective in reducing the burden of autoantibodies (anti-TPO and anti-TG) and in the control of oxidative stress. Furthermore, the literature It reinforces that lifestyle interventions and multidisciplinary support are indispensable pillars. in the management of autoimmunity. Regarding future perspectives, immunomodulation therapies (especially the use of mesenchymal stem cells and regulatory T cells) emerge as a a promising frontier, aiming not only at treating the symptoms, but also at restoring the immunological tolerance.

In summary, it can be concluded that the role of biomedical scientists and other healthcare professionals should focus on... A holistic approach to the patient. Long-term clinical studies are recommended. to consolidate supplementary protocols and new gene therapies, ensuring more comprehensive care. Personalized and effective in controlling Hashimoto's thyroiditis.

REFERENCES

ANTERO, Italo Hugo Almeida et al. Hashimoto's thyroiditis: pathophysiological, diagnostic, therapeutic aspects and impact on quality of life. RevistaFT, Rio de Janeiro, v. 28, n. 133, Apr. 2024.

DANAILOVA, Yana et al. Nutritional Management of Thyroiditis of Hashimoto's. [S. 1]: MDPI, 2022.

DE CARVALHO, Idelândia Lacerda et al. Hashimoto's thyroiditis as a prevalent etiology of primary hypothyroidism: etiopathogenic aspects, diagnostic methods and therapeutic approaches.

Year VII, v.1 2026 | Submission: 05/15/2026 | Accepted: 05/18/2026 | Publication: 05/21/2026

Brazilian Journal of Development, [sl], v. 8, no. 7, p. 52525–52536, 2022.

FERNANDES, Adriana Maia et al. Hashimoto's Thyroiditis. In: FREITAS, Guilherme Barroso L. de (org.). Endocrinology and Aesthetic Medicine. [S. 1.]: Pasteur Publisher, 2024. p. 91–97. Available at: https://editorapasteur.com.br/publicacoes/capitulo/?doi=10.59290/978-656029-140-9.11.

KLUBO-GWIEZDZIŷSKA, Joanna; WARTOFSKY, Leonard. Hashimoto thyroiditis: an evidence-based guide to etiology, diagnosis, and treatment. [S. l.]: Medycyna Praktyczna Cholerzyn, 2022.

KNEZEVIC, Jovana et al. Thyroid-gut-axis: How does the microbiota influence thyroid function?. [S. 1.]: MDPI AG, 2020.

MANSUR, Lindomária da Cruz Serpa Lima et al. Hashimoto's thyroiditis: clinical, metabolic aspects and nutritional intervention. REVISTA DELOS, [sl], v. 18, n. 69, p. e6003, 2025.

PENG, Ting; WANG, Jiangang; LIN, Yanhui. Taming autoimmune thyroiditis: cellular immunomodulation through MSCs, Tregs, and tolDCs. [S. l.]: Frontiers Media SA, 2026.

RESENDE, Bruna Ribeiro; BUENO, Silvia Messias. Hashimoto's disease: an integrative literature review. [S. l.: sn], [sd].

ROLLER, Luísa de Faria et al. Hashimoto's thyroiditis: a literature review. Brazilian Journal of Health Review, [sl], v. 6, n. 6, p. 28823–28829, 2023.

SALAZAR-VIEDMA, Marcela et al. Simulation Model for Hashimoto Autoimmune Thyroiditis Disease. Endocrinology, [sl], v. 162, no. 12, 2021.

WIMMER MACEDO, Ana Clara et al. Hashimoto's disease: advances in the treatment and management of autoimmune hypothyroidism. Journal of Medical and Biosciences Research, [sl], v. 2, n. 2, p. 1132–1140, 2025.

Ye, Sunyi; ZHU, Zhu Lixian. Stem Cell Therapy for Thyroid Diseases: Progress and Challenges. [S. [1]: Elsevier Inc., 2022.

w