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Application study of antioxidant nutritional therapy in the treatment of Hashimoto's thyroid disease

Huaijie Zhu[1,2,3*], Yucui Zhu [2], Li Zhao[2,3], Tiffiany Eschweiler[3],Xiaonan Zhu[3]

[1*] Department of Endocrinology, the Second Affiliated Hospital, Zhengzhou University, Zhengzhou, China.
[2.] Department of Dermatology in Columbia University, New York, USA.
3. Jacksun Easy Biotech Inc. New York, USA.
* Corresponding Author, Huaijie Zhu, MD.2316 Gunther Avenue, Bronx, New York, US, 10469
Tel. 917-635-2608 (USA), 150-3711-5732 (China), Jacksun689@gmail.com

Abstract: Hashimoto's thyroid disease is an autoimmune disease with unclear causes and is not easily treated. Due to the increase of anti-thyroglobulin antibody (TGAb) and anti-thyroid gland peroxidase antibody (TPOAb) in Hashimoto's thyroid disease, the hypothyroidism caused by reduced thyroxine always destroys the patient's health and life span. How to find an effective treatment plan and measure is an urgent topic in the treatment field of medicine and biology. This study reports a case of a confirmed patient with Hashimoto's thyroid disease, treated with oral thyroxine-Premierol for more than a year, and the anti-thyroxine antibody remained continuously elevated. After 80 days of treatment with the "antioxidant nutrition therapy" developed by Dr. Huaijie Zhu, the anti-thyroid antiperoxidase antibody (TPOAb) and anti-thyroid antiperoxidase antibody (TPOAb) decreased to 43.78% and 44.06%, respectively. This is a therapeutic effect that Hashimoto's thyroid disease has never been seen since it was discovered. It is hoped that this research report can inspire and promote medical and biologists to expand the research field of disease treatment, to accelerate the rapid development of Hashimoto's thyroid disease therapy and contribute to the early treatment of refractory autoimmune diseases. ["Application study of antioxidant nutritional therapy in the treatment of Hashimoto's thyroid disease". Biomedicine and Nursing 2022; 8(2): 70-76]. ISSN 2379-8211 (print); ISSN 2379-8203 (online). http://www.nbmedicine.org. 11. doi:10.7537/marsbnj080222.11.

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Introduction

Hashimoto's thyroid disease is an autoimmune disease, also known as chronic lymphocytic thyroiditis, due to the large number of lymphocytes in the thyroid tissue[1]. The disease was discovered in Hashimoto in 1992, so it is called Hashimoto's thyroid disease, Hashimoto's disease (HT or AIT); Hashimoto's thyroid disease, Hashimoto's goiter [2]. Its pathology and immune changes are similar to those of Grave's hyperthyroidism, so that Grave's hyperthyroidism transforms accordingly to Hashimoto's thyroid disease, and more Grave's disease transforms to Hashimoto's thyroid disease [3].

Hashimoto thyropathy refers to the body's immune response for autoantibodies happened and cause their own tissue damage caused by an autoimmune disease, its main pathological show the anti thyroglobulin antibody (TGAb) and resistance to the rise of thyroid peroxidase antibodies (TPOAb) [4]. And with the antigen immune complex depends on the cytotoxic antibodies, immune mediated, Immune complex and lymphocytotoxicity act on thyroid follicular epithelial cells, forming immune inflammation, inflammatory cells grow and swell, forming goiter of varying degrees, also accompanied or not accompanied by abnormal changes in T3 and T4[5]. Most patients appear hypothyroidism, be afraid of cold, puffiness, easy constipation, listlessness, irregular menstruation, etc., the way of treatment is to supplement thyroxine [6]. It is worth reminding that, since the discovery of Hashimoto's thyroid disease to today, in addition to some cases of patients with thyroxine supplementation symptoms have a certain degree of improvement, there are few cured cases [7]. This study reported that TPOAB and TGAB were significantly reduced in a case of HT treated by "Antioxidant Nutrition Therapy" [8], and the therapeutic effect was not previously achieved, which is worthy of further study and promotion.

Materials and methods

1. Clinical data: The clinical test data of patients were obtained from the outpatient laboratory of the First Affiliated Hospital of Shanxi Medical University, China.
2. Case source: Patient, female, 54 years old, was an outpatient from the Department of Endocrinology of the First Affiliated Hospital of Shanxi Medical University, China.
3. Diagnosis, serological examination and treatment of oral Euthyroxine:

3.1. In July 2019, the patient went to the hospital with partial symptoms of decreased thyroid function, hypochidosis, eye irritation, dry skin and so on as the chief complaint. Serum TGAB and TPOAB were 222.22IU/ml and 196.73IU/ml, respectively, high and normal, diagnosed as Hashimoto's Thyroid disease (see Table 1); Oral Euthyroxine 25ug/ day was initiated as supplemental treatment for exogenous thyroxine.

3.2. In August 2020, the patient went to the hospital for examination again, and the serum anti-thyroglobulin antibody and anti-thyroid peroxidase antibody were significantly increased, respectively 1198.85IU/ mL and 466.60IU/ml, which were 5.39 and 2.37 times higher than those in 2019 (see Table 1). At the same time, serum vitamin D3 was 27.67mmol/L, 66.11% lower than the normal value (75mmo/L). Serum calcium 73.59umol/L, lower than the normal (76.50) the lowest 3.80%.

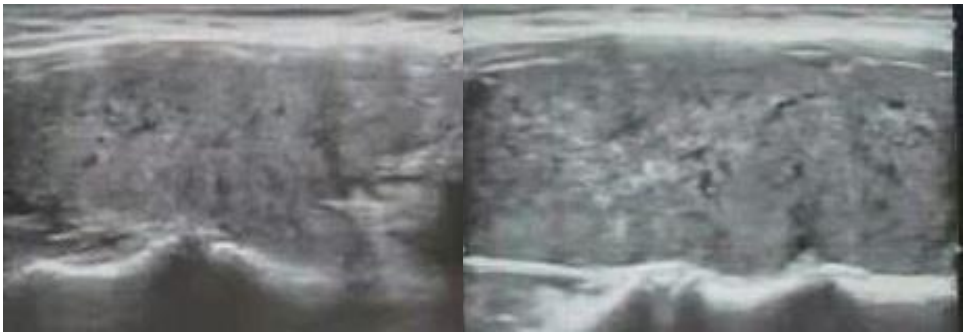
3.3. Thyroid ultrasound on 27 August 2020; It showed enlarged thyroid volume, smooth and tidy membrane, coarse and uneven parenchymal echo and reticular changes. CDFI: Abundant blood flow signals, no abnormally enlarged lymph nodes were detected on both neck (FIG. 1).

Tab.1. Patient's Serum antibody, vitamin D3 and calcium was measured

Test Date	TGAB (IU/ml)	TPOAB (IU/ml)	Serum Vitamin D3 （27.67mmol/l）	Serum Ca^{++} umol /L
Test value	222.22	196.73	27.67	73.59
Control value	0-115	0-34	75.00	76.50
UP or Down% *	93.23	478.62	- 63.11	3.80

* UP is as the times than normal percentage, Down is as the Less（-63.11 and -3.8%） than a normal percentage）.

Fig.1: Ultrasound scan on the Thyroid Gland



It showed enlarged thyroid volume, smooth and tidy membrane,
Coarse and uneven parenchymal echo and reticular changes.
CDFI: Abundant blood flow signals, no abnormal enlarged
Lymph nodes were detected on both necks

4. Implementation of antioxidant nutritional therapy:

4.1. The patient received antioxidant nutritional therapy on April 29, 2021: Therapeutic "Jiang Guian Antioxidant solid drink" (2020 China Invention Patent Number,202011155547.0; Main Classification No. : A23L2/39(20060101, under review); And nutrient supply; Nutrient supply was based on hospital laboratory tests of serum vitamins and serum vitamin D3 and trace levels of zinc before treatment (Table 1); Oral vitamin D3 2000IU(50mcg)/ day, oral zinc 20mg/ day, oral vitamin C 1000mg/ day, and vitamin E 180mg/ day.

4.2. Start Euthyrox therapy and reduce Euthyrox dosage: The patient received the exogenous thyroxine Euthyrox Tablet (50ug/ Tablet), 1/2 tablets (25ug/day) before the therapy, and gradually decreased Euthyrox dosage while the therapy was continued; In the first month, 1/2 to 1/4 tablets (12.5ug)/day, and in the second month, 1/6 tablets (6.25mg) were taken for 80 consecutive days. Thyroid function indicators were examined to determine the therapeutic effect.

Results:

1.Anti-thyroxine antibodies still increased one year after oral Euthytox treatment:

Patients diagnosed hashimoto's thyroid disease on July 24, 2019, serum anti-thyroglobulin antibody increased to 222.22IU/ml, oral thyroxine, 25ug/ day, treatment for more than 1 year, to August 2020, not only did not reduce, Instead, the serum anti-thyroglobulin antibody (TGAB) increased from 222.22IU/ML in July 2019 to 1198.85IU/ ML in August 2020, a 5.38-fold increase. Anti-thyroid peroxidase antibody (TPOAB) increased 2.37 times from 196.73IU/ML in July 2019 to 466.305IU/ ML in August 2020. See Table 1 in detail:

2. The anti-thyroid antibody of 80 angels decreased significantly after antioxidant nutrition therapy:

In this case of Hashimoto's Thyroid disease and April 29, 2021 to receive antioxidant nutrition therapy treatment to July 29, 2021, a total of 80 days, serum anti-thyroglobulin antibody from August 2020 1198.85IU/ML, reduced to August 2021 674.00IU/ ML; The decrease was 43.79%. The patient's anti-thyroid peroxidase antibody decreased from 466.60IU/ML in August 2010 to 261.00IU/ ML in July 2021. In addition, the amount of Uta was reduced from 25ug/ day to 6.25ug/ day. See Table 1 for details.

Tab.2. the Comparison of Antibody Patient who suffered from HT was Intimal Diagnosis and treated

Test Date	Anti-Thyroglobulin Antibody		Anti-thyroid peroxidase antibody		Treatment with
	Test (IU/ml)	Percentage	Test (IU/ml)	Percentage	
07/242019	222.22		196.73		Initial Diagnosis
0827/2020	1198.85	439.49	466.60	137.18	Euthyrox 25ug/day treated for 1 year
07/19/2021	674.00	- 43.78 *	261.00	- 44.06*	+ Treated with ANT** for 80 days

* Antioxidant Nutrition Therapy（ANT）.

Discussion:

1. Background, principle and purpose of "Antioxidant Nutrition Therapy" founded by Professor Zhu Huaijie in January 2021 [8].

1.1. Founding Background; the discovery of free radical as the source of all diseases provides a strong scientific basis for antioxidant therapy. Most diseases that have been diagnosed cannot be treated; The development of medical science has clearly diagnosed a variety of diseases in the human body, but the lack of effective treatment and measures, such as common tumors, hypertension, diabetes, hyperthyroidism, thyroid dysfunction, Hashimoto's thyroid disease, thyroid calcification and/or nodules and other diseases. Since the discovery of free radical and the cause of disease at the end of the 20th century, with the deepening of research, it is realized that free

radical is the source of all diseases except microorganism. The pathophysiological changes of most diseases involve the reduction of SOD content in human body and the increase of free radicals, which reduces the antioxidant function in human body. Studies have shown that at the same time, the body from birth to 25 years old SOD content in serum is the highest, reduce gradually, after 25 years old to 40 years old in serum SOD is only 1/2 at the age of 25, it could be after age 40 human one of the reasons for the increased incidence of various diseases, the study established by oxidation treatment of theoretical foundation and basis for a variety of diseases, It has also found new life for many incurable diseases.

Supplementing nutrients is one of the indispensable background for anti-oxidation and curing refractory diseases. According to various studies, nutrients are required to be ingested from the external environment in order to sustain the body's reproduction, growth, development and survival. Nutrients mainly include protein, lipids, carbohydrates, minerals, dietary fiber, vitamins and water and other seven substances. Due to the development of society and science, the main maintenance of life protein, lipid, carbohydrate, dietary fiber and water five nutrients have been rarely due to lack of disease. But the modern life science research proves that the nutrient deficiency referred to mostly involves the deficiency or deficiency of vitamins and minerals. Inadequate or deficient fat-soluble vitamins (A, D, E, etc.); And minerals according to its content is more than or less than 0.01% of the content in the body called constant and trace elements, such as vitamin D3 and calcium zinc deficiencies or lack of and induce many diseases, therefore, supplement nutrients in "antioxidant nutritional therapy" is very important part, is essential to some difficult disease treatment and auxiliary treatment and measures.

1.2. Principle of action: Through oral "Jiangguian antioxidant solid drink" to achieve anti-nourishing, combined with supplement of deficient or insufficient nutrients in the body, to achieve the treatment of diseases with "antioxidant antioxidant nutritional therapy". The ingredients in "Jiang Guian antioxidant solid drink" are composed of six products used with medicine and food, and a solid drink is made by purification of a certain process. The effective principle is that the daily dosage of "Jiang Guian antioxidant solid drink" is one bag, which can provide SOD specific activity for human body 2502 U/4.5g/ bag (556U /g). It can directly improve the SOD content of human body. At the same time, it provides abundant trace elements such as copper, iron, zinc and manganese ions needed by the human body. These four trace elements are the activator of SOD enzyme, which can improve the activation capacity of SOD and improve the antioxidant capacity of the body. Therefore, "Jiang Guian antioxidant solid drink" can achieve the effect of "antioxidant nutrition therapy", to cure Hashimoto's thyroid disease.

1.3. Objective: To try to use it in the treatment of various difficult and miscellaneous diseases.

2. "Antioxidant nutrition therapy" is a new treatment to cure Hashimoto's Thyroid disease:

Hashimoto thyropathy is a type of autoimmune disease, their immune, antigen antibody immune complex formation, cytotoxic, immune mediated immune complex, lymphocyte poison role in thyroid follicular epithelial cells, such as immune inflammation, the patient can have goiter, due to the increase in resistance to thyroid hormone antibody, thyroxine is low, Most of the patients showed symptoms of hypothyroidism. However, due to unclear reasons and mechanism of immune antibody, can only through the patient added exogenous thyroxine, because of this treatment could not fundamentally achieve of thyroid hormone in the body as a result of increased antibodies and relatively insufficient, therefore, the patient life are all in low thyroid function status, not only influence the patient's quality of life, And it will affect the patient's life span. The patient had the characteristics of hashimoto's thyroid disease that was difficult to treat. After the diagnosis, Euthyroxine was continuously taken 25ug/ day for more than 1 year. However, serum anti-thyroglobulin antibody and anti-thyroid peroxidase antibody were not decreased, but increased more significantly (see Table 1). When patients receive "antioxidant nutrition therapy" treatment after 80 days, serum anti-thyroglobulin

antibodies and anti-thyroid peroxidase antibodies have achieved a significant reduction, which is hashimoto's Thyroid disease since the discovery, there has never been such an effective treatment precedent. Hashimoto's Thyroid disease has been found as a refractory disease to be solved urgently, the establishment of "antioxidant nutrition therapy" is the only possible scientific methods and measures to cure Hashimoto's thyroid disease[8].

3."Antioxidant nutrition therapy" through the anti-free radical antioxidant principle to achieve the treatment of Ben's Thyroid disease:

Hashimoto's thyroid disease is a kind of autoimmune disease. Immunological studies have proved that the common feature of autoimmune disease is the generation of antibodies against autologous tissues for unknown reasons [9]. At now，it is still don't understand why can produce antibodies against autologous tissue, according to the principle of immunology and free radicals cause hair, may the injury and repair of tissue cells shows the different with the normal tissue structure, being mistaken for autoimmune system abnormal tissue cells, and thus produce the antibodies to resist their injury and repair of tissue, However, these antibodies not only act on autologous damaged and repaired tissue cells, but also act on other normal tissue cells similar to damaged and repaired cells, thus causing autoimmune diseases [10, 11]. For example, the typical Hashimoto's thyroid disease, while showing significant thyroid inflammation, also shows the increase of serum anti-thyroglobulin antibody and anti-thyroid peroxidase antibody (Table 1). Therefore, this study has laid an important foundation for the establishment of antioxidant nutrition therapy, and provides theoretical basis for the treatment and prevention of autoimmune disease, Hashimoto's thyroid disease and possible methods and measures.

4. Nutrients and antioxidants improve the treatment measures and methods of "antioxidant nutrition therapy" for diseases [11, 12]:

With the development of biomedical science, more and more people have realized that vitamins and trace elements are indispensable health factors in addition to sugar, protein and fat[11]. Society, science and technology and the development of human economy, the lack of sugar, protein and fat is very little disease has three kinds of nutrients, and rich life brings the increase of indoor activities, outdoor activities, reduce the habits and customs, due to the conversion of sunlight to participate in the vitamin D3, therefore, to more than 50-60% of the lack of vitamin D3. At the same time, as a result of rich living conditions, so partial food, partial hobby and lead to the lack of minerals and trace elements in the human body of the crowd is increasing. Especially when vitamin D3 is deficient or insufficient, the metabolism of calcium ions is firstly disordered, and calcium ions in plasma are increased, decreased or abnormally distributed, which is an important factor for calcification and nodules in organs such as thyroid. Calcium ion, on the other hand, metabolic disorders, and affects the blood vessels inside and outside or ion cells inside and outside flat constant, also lead to other elements ion relative lack of and deficiencies, such as low serum calcium is often accompanied by low zinc ions or trace elements such as the generation of some disorder, will cause the body tissue or cell metabolic disorder of internal and external ion, and leads to a change in organizational structure, Functional abnormalities and various diseases [12]: Such as osteoporosis, easy to fracture; If the structure changes, the same as the above free radical damage to tissue cells, will be mistaken by the autoimmune system as abnormal tissue cells, and thus produce antibodies against the autologous tissue. These antibodies not only act on autologous damaged and repaired tissue cells, but also act on other normal cells similar to damaged and repaired cells, so autoimmune diseases occur. According to the principle that nutrient deficiency may induce autoimmune disease, nutrients add antioxidant effect, and improve the establishment of "antioxidant nutrition therapy". This is why the basic principle of "antioxidant nutrition therapy" reported in this study can effectively achieve effective treatment of autoimmune disease, that is, Hashimoto's thyroid disease (Table 1).

5. Why "antioxidant nutrition therapy" can effectively treat Hashimoto's Thyroid disease?

"Antioxidant nutrition therapy" based on the above free radical increase and nutrient deficiency

induced autoimmune disease, Hashimoto's thyroid is a kind of autoimmune disease, so "antioxidant nutrition therapy" is the most likely to achieve hashimoto's thyroid disease treatment. The practice of this study proved the effect of antioxidant nutrition therapy on Hashimoto's thyroid disease. After only 80 days of treatment, serum anti-thyroglobulin antibody and anti-thyroid peroxidase antibody were significantly reduced to the effect before treatment, which was never achieved in the historical record of hashimoto's thyroid disease treatment, and it is worth promoting and expanding the application.

6. Antioxidant Nutrition Therapy reveals that SOD reduction and nutrient deficiency are one of the factors contributing to the occurrence of autoimmune diseases:

Hashimoto thyropathy as a kind of autoimmune disease, representing all autoimmune diseases, the common features of the autoimmune disease, refers to the body of its own antibody immune responses and result in tissue damage caused by the disease itself, published in the etiology and mechanism is not clear, the antioxidant nutritional therapy created the effective treatment of hashimoto thyropathy precedent; Therefore, according to the report of this study, it is suggested and speculated that the decrease of SOD, the decrease of anti-trophic function, the increase of free radicals and the deficiency or insufficiency of vitamin D3, trace elements and other nutrients in the body may be the source factors of the occurrence of autoimmune diseases, which need to be confirmed by further research.

Conclusion:

1. Antioxidant Nutrition Therapy was founded by Dr. Huaijie Zhu in January 2021, and was used for the first time in the research treatment of Hashimoto's Thyroid disease (hypothyroidism); And achieved the disease in the treatment history of the previous treatment effect;

2. "Antioxidant nutrition therapy" for the treatment of Hashimoto's thyroid disease is an innovative attempt to apply the report, hope this study reports can play the role of the topic, to remind the world medical, nutritionists to seriously, to study the antioxidant nutrients legislation, can be implemented one of the important measures for many intractable disease cure, conquer all kinds of refractory diseases affect human health as soon as possible, good for human health and longevity.

3. "Antioxidant Nutrition Therapy" revealed that SOD reduction and nutrient deficiency are the factors and principles of autoimmune diseases, which need to be confirmed by further studies.

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