

Recent Advances in Addressing Thyroid Disorders: Allopathy Versus Traditional Medicine

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Abstract

There have been many developments in healing thyroid disorders, it can be through Allopathy (modern medicine) or Traditional medicine (Herbal, Chinese, Spiritual therapy, Ayurveda, by plant or even combined) to diagnose, treat or prevent this illness. However, there are two kinds of thyroid disorders, which include Hypothyroidism and Hyperthyroidism. This review mentions how both ways are used to treat these disorders as they have disadvantages and advantages according to the way they can be used; and highlight future directions for research.

Keywords: Thyroid Disorder; Hypothyroidism; Hyperthyroidism; Modern Medicine; Traditional Medicine

Abbreviations

T₄: Thyroxine; T₃: Triiodothyronine; TSH: Thyroid-stimulating Hormone; NDT: Natural Desiccated Thyroid; TSHR: Thyroid-stimulating Hormone Receptor Antagonist; SMLs: Small-molecule Ligands; MAbs: Monoclonal Antibodies; NTADs: Nonthionamide Antithyroid Drugs; TCM: Traditional Chinese Medicine; RAI: Radioactive Iodine; TSH: Serum Thyroid-stimulating; CH: Central Hypothyroidism

Introduction

The thyroid gland, an important endocrine gland, shaped as a butterfly in the front of the neck above the trachea, weighing about 15-20 grams in an adult human. Two potent hormones thyroxine (T₄) and triiodothyronine (T₃) are produced and released into the circulation from the thyroid, hence will have an impact on the basal metabolic processes and/or enrich ingestion of oxygen in most body tissues. Additionally, thyroid hormones also have an impact on brain function including memory and intelligence, dentition, and bone development. T₄ and T₃ use iodide obtained from dietary sources or metabolized thyroid hormones and other

iodinated compounds. These hormones control the basal metabolic processes as well as the increase oxygen consumption to almost all parts of the body tissues [1]. Thyroid disorders are very common and nearly affect about 10 - 15% of the population worldwide. Selenium, Iron, Zinc and Vitamin A play an important role in thyroid hormone synthesis other than iodine. Thereby, patients should have a healthy balanced diet, and meet the daily iodine requirement for the functioning of the thyroid gland [2].

Thyroid disorder is usually classified into two ways. The first being hypothyroidism which means suppression of thyroid function. Hypothyroidism has two classifications as primary due to thyroid hormone deficiency, secondary due to thyroid-stimulating hormone (TSH), and insufficient nutrition of iodine diet. Hypothyroidism affects 5 percent of the population; an approximation of 5 percent further is not completely defined. Environmental iodine deficiency is the common cause of all thyroid disorders and other areas of iodine sufficiency, the popular cause of primary hypothyroidism is autoimmune thyroiditis also known as Hashimoto's disease [3]. The second being hyperthyroidism which means increase of thyroid

function. "Graves's disease" is a common name used for this group. This disorder is also known as thyrotoxicosis (hyperactivity of the thyroid gland). Hyperthyroidism is rare and its occurrence remains unknown. Though increase level of thyroid hormones by secretion or synthesis can be a main cause. Major symptoms include anxiety, unintentional weight loss, arrhythmia, tremor, tachycardia, dry skin, constipation, menstrual irregularities, and sweating. When left untreated or ineffectively treated include neurological and/or musculoskeletal symptoms, cardiovascular disease, and infertility. This disorder is related with decreased quality of life and even increase mortality. Levothyroxine has been the main treatment for hypothyroidism and is a prescribed medicine required for basic health care [4].

Traditional medicine

A few traditional medicines have been summarized in this review. Traditional medicine has been proven useful in several diseases specially through studying phytoconstituents and secondary metabolites. From the past few years' herbal drugs have proved a strong presence in helping to treat different metabolic diseases like hormonal imbalance and diabetes. This review depicted how herbal drugs have an impact on treating a slow progressing disease thyroid. Thyroid disorder happens when the thyroid gland grows slightly, and this is caused by an irregular growth of thyroid hormones. Hypothyroidism results from low levels of T_4 and T_3 in the circulation system hence metabolism of the body slows down and causes the following symptoms such as excessive weight loss, feeling cold, fatigue, blood pressure low and constipation etc. as discussed earlier [5].

Hyperthyroidism is caused by an increase of T_4 and T_3 levels in the systemic circulation. Several herbs have acted as anti-thyroid activity in both hypothyroidism and hyperthyroidism diseases. An herb called Bugleweed (*Lycopus virginicus*) is used as thyrosuppressive agent that overcomes the thyroid function. It inhibits the binding of the antibodies for Graves's diseases to the thyroid disease. Lemon balm (*Melissa Officinalis*) is also used a thyrosuppressive agent in treating hyperthyroidism by blocking the TSH binding to the receptor by acting on the hormones and receptors. Motherwort (*Leonurus cardiac*) has a common anti-inflammatory activity since it contains flavonoids. This herb is mostly used in a combination with other herbs. Motherwort is known to treat symptoms of tachycardia and anxiety. Gotu Kola

(*Centella asiatica*) leaf comprises of asiaticoside, madecassic acid, and asiatic acid which is beneficial for treating hypothyroidism. The leaf has an energizing property to stimulate T_4 synthesis [4].

Traditional Chinese medicine (TCM) is known to treat infections, ailments, and other health problems for thousand years. Today, TCM can be used to observe and experience the treatment patterns that are closely related to hypothyroidism. TCM practice measurements of thyroid hormone levels, TSH figures and immunoglobulins. This can give a clear understanding of the disease and a clue to different herbal therapeutic approaches that can be applied. According to the TCM differentiations and treatment, hypothyroidism is associated with edema, consumptive deficiency, and other signs. Herbal and Acupuncture therapy can be used be along with the hormone replacement therapy to get a better result and overcome the unfavorable effects of levothyroxine (allopathic), On the other hand, it is important to know that all herbal preparations such as tonifying formulas have specific explanations and related effects and should never be used casually. When it comes to studying Conventional Western schools of medicine, the organ of the body is arbitrated, the body is studied as a sum of its parts and treated separately. Hospitals have different departments for treating different organs: one for the endocrinology, one for the heart patients; yet another one for surgery etc. While TCM is treats the whole body as a 'whole' and each body part is seen as a surface of the wider context. The diagnosis in the TCM pattern was controlled to recognition of signs and symptoms usually seen in hypothyroidism and tactual exploration of neck nodules in the thyroid gland. When compared to modern TCM, TSH values and immunoglobulins, can explain the type of disease and provide options to many herbal therapeutic methodologies that may help treat hypothyroidism. Hence, clinical management of this disorder has been a greater interest in the TCM area; making hypothyroidism no less dominant in the modern day TCM practice [5]. A pilot research study by Lee, Chung and Lee [6], showed the possibility effect on the intake patterns of Korean traditional alternative remedial amounts in thyroidectomized patients under hormone supplement in improving euthyroid status without an increase in levothyroxine.

Allopathy

People with hypothyroidism disorder should take thyroid hormone replacement medication to rebuild enough thyroid hormone levels in the body except those whose thyroid gland is

short term or reversible. These medications have been designed with different options, that differ not only with their content but their purpose. There are some goals of this medication: lessen the size of an enlarged goiter if there, removal symptoms of hypothyroidism, control the TSH level, and avoid becoming hyperthyroid. Many kinds of drugs are used to treat hypothyroidism such as Levothyroxine, this is a synthetic form of T_4 hormone that should be converted into T_3 to be used by the cells. Liothyronine is a manufactured form of T_3 , T_4 monotherapy and is recommended as a combination of T_4/T_3 therapy to treat hypothyroidism. Therefore, this medication is usually preferred. Research has been ongoing if the combination of T_4/T_3 therapy can benefit a group of people with hypothyroidism who have a genetic mutation. This research maybe a valuable study to a future alteration on taking care of thyroid. Natural desiccated thyroid (NDT) also known as a natural thyroid, is prescribed as a drug that is obtained from a dried thyroid gland of pigs. NDT has both T_4 and T_3 . Most doctors do not prescribe the use of this drugs because it contains the ratio of T_4 to T_3 which does not match the ratio of T_4 to T_3 in humans, hence only selective patients may respond well to NDT.

Hyperthyroidism is caused by Grave's disease, non-cancerous thyroid nodules, inflammation of thyroid and failure of pituitary gland. Treating hyperthyroidism is more complicated than hypothyroidism, it requires one or more treatments: radioactive iodine (RAI), anti-thyroid drug and thyroidectomy which is a surgery to remove the gland. The only medications required for hyperthyroidism are anti- thyroid drugs such Tapazole which inhibits the thyroid from using iodine from the diet to yield thyroid hormone and propylthiouracil hinders the thyroid gland from using iodine, hence this slows the overproduction of thyroid hormone. it prohibits the conversion of thyroid hormone T_4 and T_3 . Thyroid cancer is treated with surgery, by the removal of the whole thyroid gland or the lobe of the thyroid gland. Medication called Levothyroxine is required after surgery, this drug is used to treat hypothyroidism because thyroid surgery for cancer is carried out for other cases of underactive thyroid. Suppressing of the TSH is vital for prevention of the cancer to return. Radioactive-Iodine therapy is used for large thyroid cancer that has spread to the lymph nodes or a higher risk for a recurrent cancer. Iodine given in a hospital setting in either liquid form or tablet, the goal is to kill off any cancer cells that will be present after surgery and destroy any remains of thyroid tissue. Chemotherapy works by killing the

dividing cells, like cancer cells. Researchers have developed many drugs called "targeted therapies" that will target specific markers on cells that have cancer. Nexavar and Lenvima are drugs that have been used - kinase inhibitors work by hindering thyroid cancers from growing and producing new blood vessels [7].

Other advances include Serum thyroid-stimulating (TSH) testing, this is a best screening tool for thyroid dysfunction. To assess palpable goiter and thyroid nodules, thyroid ultrasound is used. For thyroid nodules, an ultrasound fine needle biopsy is utilized, this will depend on the size and sonographic appearance. Biopsy should be seen regularly on tiny nodules around the range of <1 cm. It is still debatable whether pregnant women can be screened for thyroid disorder, tests during pregnancy are not well found, and it is unsure if thyroxine cure for pregnant women with serum TSH levels between 2.5 and 4.0 mU/L is helpful. Recommendation of iodine supplement is given during pregnancy [8].

According to Burch [9] some drug side effects are known to affect thyroid function or analysis of the results of thyroid laboratory testing. Drugs alter the binding of thyroid hormone to protein transporters and the modification of T_4 and T_3 as well as the metabolism and recovery of thyroid hormone. Many drugs have affected the efficiency of thyroid hormone therapy, entailing to be watchful to stop undertreatment along with the drugs they are being taken and overtreatment after they have been stopped. Knowing these interactions, allows clinicians to keep a track of patients for them, and to avoid testing and treatment that are unnecessary.

The future

Human history is called the history of medicines that is used to treat and stop different kinds of diseases. It is necessary to keep producing better drugs to counter danger from illnesses and survival of the species. Modern medicine has advanced from traditional medicine in two ways: drugs that have the same effects and drugs with various effects from those of traditional medicine. In the past of drug development, it has been proven that many drugs have been obtained as an outcome of inspiration from traditional medicine. Natural products have not met the exact requirements when it comes to the application of, and search into. In the future, research, new ideas, pharmacology network, and big data will

make it possible to explain mechanisms of natural products and traditional medicine from better drugs [10].

Nonthionamide antithyroid drugs (NTADs) can be useful in controlling symptoms of hyperthyroidism in some occasions where thionamide cannot be used. NTADs have different side effects, indications, and mechanisms of action. These differences can help a clinician choose the right drugs for the patients. Different remedies for Graves' disease such as rituximab, thyroid-stimulating hormone receptor antagonist (TSHR), small-molecule ligands (SMLs) and Monoclonal antibodies (MAbs) are being investigated [11], another clinical observation was made where patients with thyroid disorders were treated with Ayurvedic medicine (an old system of medicine in India that uses herbal based medicines to cure diseases) upon the state of each patient. Consistent results were observed for thyroid treatment and further studies should continue to understand the mechanism of ksheerbala (preparation of *Sida corifolia* in milk) particularly.

It may be beneficial in knowing how Ayurvedic drugs can work in a physical state, especially in thyroid disorders to start with [12]. Large evidence depicted that subclinical and clinical hyperthyroidism can increase the risk of May solid cancerous growth while hypothyroidism may reduce or delay the onset of cancer. Studies supported a dysregulation of the thyroid hormone that turns secondary to cancer treatment or thyroid hormone supplement was seen to affect cancer outcomes. To date, preclinical and clinical research in many cancer types have shown future outcomes following chemical reduction of thyroid hormones or alteration [13]. Treatment with Mifepristone in patients that have Cushing syndrome can make a difference in thyroid hormone levels, of which effect the thyroid hormone metabolism remains poorly understood, in patients with central hypothyroidism (CH), more data is needed to determine its pathophysiology and prevalence involved. Mifepristone should be studied further for long term treatment [14,15].

Conclusion

Treatment for thyroid diseases and symptoms can vary on the type of problems you have. To look at it, these thyroid disorders can be treated/cured through allopathy or traditional medicine or, in some cases, surgery. Both allopathy and traditional medicines have their pros and cons and can be studied further for better treatment

to thyroid patients that have disorders. Further research should be carried in the areas of hypothyroidism and use of levothyroxine monotherapy. Focus should be on further clinical studies to investigate the signs for adding thyroxine to the treatment for Graves' disease.

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