IJBPAS, December, 2023, 12(12): 5709-5720

ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)

'A Bridge Between Laboratory and Reader'

www.ijbpas.com

HYPOTHYROIDISM – REVIEW

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Received 19th Nov. 2022; Revised 16th Dec. 2022; Accepted 1st April 2023; Available online 1st Dec. 2023

https://doi.org/10.31032/IJBPAS/2023/12.12.7637

ABSTRACT

Hypothyroidism is the pathological condition when the level of thyroid hormones drops to a deficient state. This document discusses the treatments used to manage hypothyroidism from the Ayurvedic and contemporary therapeutic viewpoints based on research papers gathered from reliable sources including Google, Google Scholar, PubMed, and Science Direct using various keywords. There is an increasing demand to understand the disease in view of Ayurveda and to establish the management through Ayurvedic system of medicine. The thyroid gland isn't specifically mentioned in Ayurveda, but the physiological and biochemical actions of the thyroid hormone can be paralleled to how *Agni* is described. *Jatharagni Vardhaka* and *Rasadhatwagni Vardhaka* are effective drugs to treat the illness. Numerous herbs, Ayurvedic classical formulations, Yoga poses, pranayama, and yagna therapy have found to be beneficial in the treatment process.

Keywords: Ayurveda, Hypothyroidism, *Galaganda*, Herbs

INTRODUCTION:

The medical disease known as hypothyroidism occurs when the level of thyroid hormones drops to a deficient state. The majority of the time, hypothyroidism is classified as a biochemical condition due to the wide range in clinical manifestation and lack of early warning signals **[1]**. TSH levels that are higher and free thyroid hormone (T3/T4) levels that are lower than the reference range are indicators of overt

or clinical primary hypothyroidism, respectively. TSH levels that are above the reference range while free thyroxine levels are within the normal range are signs of mild or subclinical hypothyroidism **[2]**. This is frequently thought to be a symptom of early thyroid insufficiency. Others claim that central and peripheral hypothyroidism, as well as primary, secondary, or tertiary hypothyroidism, are different types of hypothyroidism. The absence of thyroid hormones that are active in the body causes basic hypothyroidism. TSH insufficiency causes secondary hypothyroidism, but a thyrotropin-releasing hormone (TRH) deficiency causes tertiary hypothyroidism, which is marked by decreased TSH production. Less than 1% of cases of central and peripheral hypothyroidism are found worldwide, each with distinctive causes **[3]**.

There are various research that discuss the use of synthetic and natural treatments for hypothyroidism. The aetiology of hypothyroidism is significantly influenced by auto immunity. Dyslipidemia, a key risk factor for many serious illnesses, is one of the repercussions of the disease hypothyroidism, and thyroidism itself, when at its worst, can result in life-threatening conditions **[4]**. As a result, it causes a long life of pathological occurrences and renders the sick individual permanently dependent on hormonal replacement. For more than a century, hormone replacement therapy has been a crucial strategy for treating the signs and symptoms of disease **[5]**. The natural thyroid preparations, such as thyroid extract, desiccated thyroid, or thyroglobulin, which once contained both T3 (tri-iodothyronine) and T4 were the first type of hormone replacement therapy to enter the scene (thyroxine). The rise in serum TSH level may be lessened toward normalcy and clinical remission with L-thyroxine monotherapy. Human recipients of T3 and L-thyroxine (LT4) at the same time demonstrated advantages over those receiving monotherapy, however this has not been supported by numerous clinical investigations **[6, 7]**. Therefore, finding a suitable LT4 substitute is essential for the treatment of hypothyroidism. In Ayurveda, the idea that lifestyle factors into the development of an illness is a very old and well-known one. Due to modernisation and the influence of western culture, people's eating habits and lifestyles have changed dramatically in recent years. Sedentary lifestyles and unhealthy eating patterns contribute to a number of ailments, including metabolic disorders. The symptoms of hypothyroidism are infamous for being non-specific and closely resembling those of other systemic

illnesses. It results in a lifetime of pathological occurrences and renders the affected person permanently dependent on hormonal replacement. Thus, there is an increasing demand to understand the disease in view of Ayurveda and to establish the management through Ayurvedic system of medicine **[8]**.

Different traditional medical (TM) systems, such as traditional Chinese medicine (TCM) and traditional Korean medicine (TKM), have been investigated and effectively demonstrated to have benefited both hypo- and hyperthyroidism patients. Ayurveda, which was discovered to have increased serum T3 and T4, is one of the herbal therapies that have been discovered mentioned in the ancient science of traditional medicines. The thyroid gland isn't specifically mentioned in Ayurveda, but the physiological and biochemical actions of the thyroid hormone can be paralleled to how *Agni* is described (digestive power maintaining body metabolism). Additionally, among the 20 different types of *Kaphaja* ailments, Charaka includes a condition known as *Galaganda*, which manifests as a single swelling in the neck. *Galaganda*, according to Susruta, is an encapsulated swelling in the anterior angle of the neck that can be associated to a goitre or tumour and may or may not impair thyroid function **[9, 10]**.

ETIOLOGY/ *NIDANA:*

Hypothyroidism can result from either inadequate thyroid gland function (named Primary hypothyroidism) or from inadequate thyroid hormone stimulation (called Secondary hypothyroidism). Iodine deficiency, autoimmune disease (Hashimoto Thyroiditis), radiation therapy, medications, or thyroid surgery are the main causes of primary hypothyroidism **[11]**. Tertiary (hypothalamus) hypothyroidism: Infiltrative disorders (eg: Sarcoidosis, histiocytosis, lymphoma, hemochromatosis), and medication induced. These days, medication-induced hypothyroidism is a major cause for concern. These drugs may be used to treat various conditions, but they may also have a direct or indirect impact on thyroid function. These substances, such as glucocorticoids, bromocriptine, octreotide, opioids, phentolamine, growth hormone, etc., cause hypothyroidism by reducing the secretion of TSH. Iodine, amiodarone, thioamides, thiocyanates, amino-glutethimide, perchlorate ions, lithium, and certain cytokines are examples of medications that may negatively affect thyroid hormone synthesis and secretion. Other medications act by changing the metabolism of thyroid hormones, such as rifampicin, phenytoin, carbamazepine, barbiturates, tyrosine kinase inhibitors

(calcium compounds, sucralfate, ferrous compounds, colesevelam, antacids, coffee etc.) **[12]**.

According to Ayurvedic *Nidana*, the development of hypothyroidism may be caused by etiological variables related to *Kapha-Vata Prakopaka, Agnimandya Janaka*, and *Rasapradoshaka Nidan.*

PATHOPHYSIOLOGY (*SAMPRAPTI*):

The primary cause of disease is an imbalance between the mind, body, and soul. According to Charaka Samhita, when a person is suffering from grief, fear, wrath, sorrow, excessive sleep, or excessive vigilance, sanitary food consumed in the right quantity does not get properly digested **[13]**. Sushruta Samhita also contains the description. Thyroid is described in Ayurvedic literature as being a component of *Rasabaha Srotas* (Lymphatic Channel). According to Ayurveda, a balanced state of the three bodily humours *Vata* (air), *Pitta* (fire), and *Kapha* (mucus/water) is what constitutes good health. The primary factor causing thyroid gland enlargement is an imbalance between the three doshas of air (*Vata*), mucus or water (*Kapha*), and fat (*Meda*) (*Galaganda*). In ayurveda, the pathophysiology of hypothyroidism is not fully explained. Hypothyroidism is a *Vata-Kapha* condition, according to Charaka. It is regarded as a condition of "*Pitta Kshaya* (reduction in pitta), *Kapha Vridhi* (increase in *Kapha* or mucous), and *Medodusthti* (impairing of fat), consequently influencing the *Srotas* (channels) of the body **[14]**." The *Vata, Khapha,* and *Meda* produce hormonal (OJUS) imbalance when they are stimulated or out of balance, which causes the gland called *Galaganda* to swell **[15]**. The disorder may onset with loss of appetite or immunity.

Bijadosha and *Apathya Nidan Sevana* cause *Tridosha Dushti,* which causes *Jatharagni Mandya,* which results in *Dhatwagnimandya*, which results in *Uttarrottara Dhatu Vikriti*, which eventually results in *Oja Vikriti*. The body's *Vyadhi Kshamatva* is impacted by this *Vikrita Ojas*, which in this instance is frequently brought on by the presence of Pitta dosha. The thyroid gland is attacked, and an autoimmune illness ensues. It is a *Kaphapitta Samsarga* condition as a result. Another hypothesis claims that the roles of thyroid hormones are comparable to those of the *Agni (Jatharagni, Dhatwagni*, and *Bhootagni*) in our bodies, generating changes and tissue metabolism at different levels and preserving the BMR. *Agni Mandya* at any degree brought on by *Kaphakara Nidana* causes an increase in *Dhatugata Mala Sanchaya*, which compromises *Dhatu Saras* and causes *Srotorodha*, which results in the physical

and mental symptoms of hypothyroidism. *Vata* aggravates the *Kapha Dushti* by acting as a *Yogavahi*. It is a *Vata-Kapha Samsarga* state as a result.

The derangements in gonadotropins, leptin, and other hormones associated with eating and sleeping that alter the hypothalamic-pituitary (HPT) feedback system and affect thyroid hormone levels are taken into account by contemporary therapies **[16]**. Thyroid tissue is destroyed by antibodies against thyroperoxidase, thyroglobulin, thyroid stimulating hormone (TSH), and its receptors, resulting in Hashimoto thyroiditis **[17]**.

Samprapti Ghatakas

Dosha – Vata-Kapha

Dushya – Rasa, Rakta, Mamsa, Meda, Asthi, Shukra

Agni – Jatharagnimandya, Dhatwagnimandya

Srotodushti – Sanga, Vimargagamana

Rogamarga – Bahya, Abhyantara, Madhyama **[18]**

CLINICAL PRESENTATION/ *ROOPA*:

The following table explains that aberrant *Jatharagni* and *Dhatwagni*, abnormal *Kapha* and *Vata Dosha*, and abnormal *Rasavaha, Raktavaha, Medovaha, Shukravaha*, and *Manovaha Srotas* are all present in hypothyroidism.

Clinical presentation [19-22]	*Dosha* involved [23]	*Srotas* [24, 25]
Fatigue, loss of energy	*Vata, Kapha*	*Rasavaha*
Lethargy, sleepiness	*Kapha*	*Rasavaha*
Weight gain	*Kapha*	*Rasavaha, Medovaha*
Decreased appetite	*Kapha*	*Rasavaha*
Cold intolerance	*Vata, Kapha*	*Rasavaha*
Dry skin	*Vata*	*Rasavaha*
Hair loss, straw like, coarse, brittle hair	*Vata*	*Asthivaha*
Muscle pain, joint pain	*Vata*	*Asthivaha*
Dull facial expression, depression, mental impairment, forgetfulness, inability to concentrate	*Vata*	*Manovaha*
Slowed movements	*Kapha*	*Rasavaha, Raktavaha, Mamsavaha*
Decreased hearing, decreased vision	*Vata*	*Rasavaha*
Infertility, Menstrual disturbances	*Vata*	*Artavavaha, Shukravaha*
Constipation	*Vata*	*Purishavaha*
Paraesthesia	*Vata*	*Rasavaha, Medovaha, Majjavaha*
Hoarseness in voice	*Kapha, Vata*	*Pranavaha*
Periorbital puffiness	*Kapha*	*Rasavaha*
Simple or nodular Goitre	*Kapha*	*Rasavaha, Mamsavaha, Medovaha*
Bradycardia	*Kapha*	*Rasavaha, Raktavaha*
Non-pitting oedema, pericardial effusion, abdominal distension, ascites	*Kapha*	*Rasavaha*

Myxedema is the medical term for abnormally low thyroid levels. Myxedema is a highly severe illness that can have dangerous side effects, such as low body temperature, anaemia, heart failure, confusion, and coma. The signs of hypothyroidism typically appear gradually over months or years. They can include:

- Feeling tired (fatigue).
- Having constipation.
- Gaining weight.
- Feeling soreness all over your body (can include muscle weakness).
- Having higher than normal blood cholesterol levels.
- Having tingling and numbness in your hands.
- Feeling depressed.
- Being unable to tolerate cold temperatures.
- Having dry, coarse skin and hair.
- Experiencing a decrease sexual interest.
- Having frequent and heavy menstrual periods.
- Noticing physical alterations in your face (including drooping eyelids, as well as puffiness in the eyes and face).
- Having your voice become lower and hoarser.
- Feeling more forgetful ("brain fog").

Sadhyasadhyata:

The condition has a *Sadhya* and *Kruchra Sadhya* prognosis, meaning that the cause of the illness should be identified before choosing an *Ausadha* (medication), *Ahara* (food), and *Vihara* (activities) regimen. Since *Agnimandya* is the primary contributing component, if management is successful in managing *Agni* properly, the prognosis is for *Sadhya*.

The prognosis for Adult Subclinical Hypothyroidism, which recovers to normal health after treatment, is good, according to contemporary knowledge. In order to prevent neurological problems from becoming irreversible with treatment, cretinism should be identified and treated as soon as feasible.

TREATMENT/ *CHKITSA*:

Ayurveda and contemporary treatment systems have differing concepts regarding the pathogenesis of disease. As a result, treatment methods alter, but the ultimate objective is to treat the disease.

- Modern medicine treatment include use of:

Levothyroxine sodium: as a part of hormone replacement therapy. The typical replacement medication for primary or central hypothyroidism is levothyroxine (T4) **[20]**. Certain novel formulations, such as liquid formulations, soft gel formulations, and sustained-release formulations with increased bioavailability above conventional tablets, are offered for patients with poor absorption of levothyroxine **[26]**.

Antioxidants like selenium: can help prevent Hashimoto thyroiditis, thyroiditis during childbirth, and clinical hypothyroidism by helping the body absorb 200 g/day of selenium as selenomethionine **[20]**.

- Ayurvedic principles of treatment:

In ayurveda, thyroid gland is defined as a lymphatic Channel (*Rasavaha Srotas*) **[27]**. The treatment takes a wholistic approach to the mind, behaviour, body, and environment as a whole. Prior to beginning any oral medication, its primary goal is to open up any clogged body channels in order to balance the *Tridoshas*. After that, *Rasayana* (rejuvenative) therapy is used. Hypothyroidism is viewed as a state of "*Pitta Kshaya, Kapha Vridhi*, and *Medodusthti*" in accordance with ayurvedic ideas (increase of *Kapha* and impairment of fat)" **[28]**. Therefore, in cases of hypothyroidism, a therapy regimen targeted specifically against *Agni, Rasavaha, Mamsavaha, Medovaha, Manovaha Srotas* as well as *Vata* and *Kapha Dosha* should be used. Additionally, *Rasadhatu Janita Vikara's* treatment course was described as *Langhana* **[29]** i.e. *Dashavidha Langanas* are explained according to *Roga-Rogi Bala*, The treatment's fundamental premise is *Vatadosa Chikitsa*, which is dominated by the *Kapha Dosha*.

Herbal plant used traditionally in management of hypothyroidism: [30-33]

Sr. No.	Botanical Name/Family	Common names	Part used
1.	*Bacopa monnieri* Scrophulariaceae	*Brahmi*	Whole plant
2.	*Pistia startiotes* Araceae	*Jalakumbhi*	Whole plant
3.	*Cassia fistula* Caesalpiniaceae	*Aaragvadha*	Root, leaves, flow-er, fruit pulp
4.	*Vitex nigundo* Verbenaceae	*Nirgundi*	Root, leaves, seeds
5.	*Linum usitatissimum* Linaceae	*Alsi/Bijari*	seeds
6.	*Bauhinia variegata* Fabaceae	*Kanchanara*	Bark
7.	*Eichhornia crassipes* Pontederiaceae	*Water hyacinth*	Whole plant
8.	*Bauhinia purpurea* Fabaceae	*Khairwal*	Bark

9.	***Saussurea lappa*** **Compositae**	***Kuth***	**Root**
10.	***Morus alba*** **Moraceae**	***Shahtoot***	**Leaf**
11.	***Zingiber officinale*** **Zingiberaceae**	***Adrak***	**rhizome**
12.	***Withania somnifera*** **Solanaceae**	***Ashwagandha***	**Root**
13.	***Commmiphora mukul*** **Burseraceae**	***Guggulu***	**Oleo-resin, gum**
14.	***Moringa oleifera*** **Moringaceae**	***Shigru***	**Root, seeds, leaf**
15.	***Achyranthes aspera*** **Amaranthaceae**	***Apamarga***	**Whole plant**
16.	***Inula racemosa*** **compositae**	***Pushkarmool***	**Root**
17.	***Crataeva nurvula*** **Capparidaceae**	***Varuna***	**Bark, root**
18.	***Magnifera indica*** **Anacardiaceae**	***Mango***	**Fruit Peel**

Classical *Yogas* which may be used are *Vaishwanara Choorna* (Chakradtta Amavata chikitsa), *Guggulutiktaka Kwatha* (Ashtangahrudayam Chiktisasthana 21/57-60), *Panchakola Choorna* (Sharangdhara Samhita Madhyama Khanda 6: 13-14), *Shiva Gulika* (Ashtanga Hrudaya Uttarasthana 49/293), *Ashtavarga Kvatha* (Sahasrayoga – Vatarogachikitsa.), *Guggulu Tiktaka Ghrita* (Ashtangahrudayam Chiktisasthana 21/57-60). *Vaman, Virechan Nasya* and *Rasayan* therapy as well can also be utilized. All these methods help restore the homeostasis and metabolic activity in body.

Yoga is regarded as a valuable art form for soul and body renewal. Sarvangasana, Halasana, Matsyasana, Naukasana, and Surya namaskar are some of the asanas that are helpful in treating hypothyroidism. Suryabhedana, Anulom-Vilom, and Ujjayi Pranayam are some additional beneficial pranayams **[34]**.

In one study, a patient (Male/60 years old) had been taking allopathic medications for high blood pressure, SCH, and B12 complex for the past two years and four months (pre-data), yet his TSH had never returned to normal. The patient kept taking the prescribed medication and added Yagya Therapy for three months. After finishing Yagya-Therapy for 4 months, post-data was then compiled. TSH levels were extremely high before Yagya-Therapy, ranging from 4.79 to 11.82 ng/ml, and they returned to normal (3.0 ng/ml) after the procedure. The B12 levels, which had been previously low (238-326 pg/ml), likewise rose to the higher end of the normal range (1034 pg/ml). The patient's other ailments, including fatigue, sluggishness, and sleep problems, were also entirely gone **[35]**.

CONCLUSION:

Thyroxin [T4] and triiodothyronine [T3], two related hormones, are produced by the thyroid gland. These hormones aid in the maintenance of the body's thermogenic and metabolic homeostasis and are essential for cell differentiation during development. Maintaining metabolism as a foundation *Dhatwagnimandya* in Ayurveda can be used to better understand hypothyroidism. Therefore, *Jataragni Vardhaka* and *Rasadhatwagni Vardhaka* are effective drugs to treat the illness. Yoga poses, pranayama, and yagna therapy have also been proved to be beneficial in the treatment process. All of the pathogenetic variables that contribute to hypothyroidism must be addressed throughout treatment, with a focus on body, mind, and dosha strength in particular. Although numerous pharmacological activities and studies on plants and nutritional supplements for the treatment of hypothyroidism have been described, no clinically significant benefits have yet been demonstrated. This qualifies them as a good choice for in-depth research utilising relevant animal models in the context of hypothyroidism and other associated illnesses.

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