

A review of Graves' Disease, a Hyperthyroid condition The Western and Ayurvedic Perspective

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June 14, 2021 | The Hague, the Netherlands

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A research paper written by Riim Lagerwerf for CAS1**

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Introduction

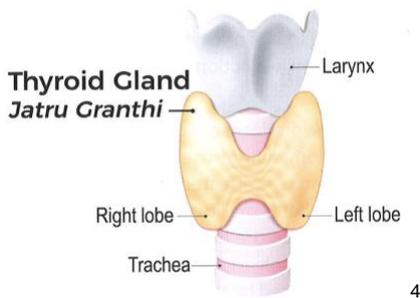
“Doctors of the future will finally bow to the stampede of patients seeking holistic care and recognize the value of Ayurveda and how it fills gaps in modern medicine. They will know just enough about Ayurveda to feel comfortable referring patients to us and, more important, when a referral is necessary.” - Marianne Teitelbaum, D.C., Healing the thyroid with Ayurveda.

Thyroid gland disorders are a growing worldwide health issue. Thyroid hormone regulates metabolic rate of the body. Failure of thyroid hormone to maintain metabolic rate mainly produces hyperthyroidism or hypothyroidism. Thyroid disorders are characterized by physical and mental abnormality. ¹ Hyperthyroidism is one of the six major diseases of the thyroid. The six major diseases of the thyroid are as follows:

1. euthyroid goiter;
2. euthyroid sick syndrome;
3. hyperthyroidism;
4. thyroiditis;
5. hypothyroidism;
6. thyroid cancer. ²

The most common form of hyperthyroidism is Graves' disease. ³ This research paper reviews Graves' disease from a Western and Ayurvedic perspective. In order to understand what Graves' disease is, this paper will first review the function and physiology of the thyroid gland as part of the endocrine system. A review is then presented of what hyperthyroid disease is, followed by reviewing diagnosis and management of Graves' disease according to Western medicine. The Ayurvedic interpretation, classification is then presented through review of classical texts, articles and textbooks. It includes a review of the pathology according to Ayurveda. The paper concludes with brief overview of the management of the disease from the Ayurvedic perspective.

Thyroid gland and the endocrine system



The thyroid gland is a brownish-reddish gland situated in the front of the neck, at the third and fourth tracheal ring. The gland synthesizes iodine to promote cellular metabolic activity. Thyroid stimulating hormone (TSH) produces triiodothyronine (T3) and thyroxine (T4) hormones. The pituitary gland and hypothalamus regulate the production of TSH, which causes T3 and T4 hormones to move in the blood circulation and at the cellular level, where they maintain metabolic activity.

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The endocrine system consists of a group of glands and organs that regulate and control various body functions by producing and secreting hormones. Hormones are chemical substances that affect the activity of another part of the body. In essence, hormones serve as messengers, controlling and coordinating activities throughout the body.⁶ The glands of the endocrine system each produce one or more specific hormones. The major glands are:

- hypothalamus;
- pituitary gland;
- thyroid gland;
- parathyroid glands;
- islet cells of the pancreas;
- adrenal glands;
- testes in men, and the ovaries in women.

The thyroid gland is located in the front of the neck and is a butterfly shaped gland about two inches in size.⁷ Thyroid disorders are the most common disorders we see in today's world. The function of thyroid gland under normal condition is to maintain body metabolism. This action is carried out by the hormones produced by thyroid gland. The failure of these hormones to maintain normal metabolic rate in body produces two most common conditions either hypothyroidism or hyperthyroidism. Under-function of thyroid gland reduces production of thyroid hormone which decreases body metabolism and give rise to many sign and symptoms like fatigue, constipation, dry skin, etc. all together included under heading of hypothyroidism. Similarly, over-function of thyroid gland increases metabolic rate of the body by increasing the thyroid hormones and leads to various conditions like weight loss, anxiety, tremors, etc. which are together called as hyperthyroidism.⁸ Although every cell in the body has receptor sites for specific hormones, only two types of receptor sites are found on all cells. They are thyroid hormone and vitamin D receptor sites. This indicates that literally every cell in the body is dependent of normally functioning thyroid gland, and accounts for why the thyroid gland responds to every insult in the body. The ubiquity of the receptor sites show that science is only skimming the surface of what is known about the effects of Vitamin D's on

the human body.⁹ A receptor is a molecule with a specific three-dimensional structure, which allows only substances that fit precisely to attach to it— as key fits in its lock. Receptors enable natural (originating in the body) substances outside the cell to influence the activity of the cell. Examples of such substances include neurotransmitters (chemicals that conduct messages between cells in the nervous system) and hormones (chemicals released into the bloodstream by one organ to affect another organ). That influence may be to stimulate or inhibit a process inside the cell.¹⁰

The thyroid gland takes iodide ingested through food and converts it to iodine and then uses it to build the two thyroid hormones: Triiodothyronine (T-3) and Thyroxine (T-4).¹¹ When thyroid hormone levels fall too low, the hypothalamus secretes thyrotropin-releasing hormone (TRH), which stimulates the pituitary gland to release thyroid-stimulating hormone (TSH), which signals the thyroid to make hormones. When thyroid hormone levels become too high, TSH levels decrease to signal the thyroid to reduce its production of hormones.¹²

Hyperthyroidism and Graves' Disease

Graves' disease is an autoimmune disease that leads to a generalized over activity of the entire thyroid gland.¹³ Robert Graves' first identified the association of goiter, palpitations, and exophthalmos in 1835, although Caleb Parry had published details of a case 10 years earlier.¹⁴

Graves' disease is a condition of hyperthyroidism plus one or more of the following:

- goiter;
- Exophthalmos (protruding eyes);
- Pretibial myxoedema (non-pitting, hard edema around the ankles).¹⁵

Many common symptoms of hyperthyroidism are similar to those of adrenergic excess, such as nervousness, palpitations, hyperactivity, increased sweating, heat hypersensitivity, fatigue, increased appetite, weight loss, insomnia, weakness, and frequent bowel movements (occasionally diarrhoea). Hypomenorrhea may be present. Signs may include warm, moist skin; tremor; tachycardia; widened pulse pressure; and atrial fibrillation.¹⁶ Susceptibility to Graves' disease is determined by a mixture of genetic, environmental, and endogenous factors, which are responsible for the emergence of auto reactivity of T and B cells to the thyrotropin receptor. The mechanisms involved are unknown.¹⁷ The condition has an autoimmune cause.¹⁸ Graves' disease is triggered by a process in the body's immune system, which normally protects us from foreign invaders such as bacteria and viruses. The immune system destroys foreign invaders with substances called antibodies produced by blood cells known as lymphocytes. Sometimes the immune system can be tricked into making antibodies that cross-react with proteins on our own cells. In many cases these antibodies can cause destruction of those cells. In Graves' disease, these antibodies, called the thyrotropin receptor antibodies (TRAB) or thyroid stimulating immunoglobulins (TSI) do the opposite

– they cause the cells to work overtime. The antibodies in Graves' disease bind to receptors on the surface of thyroid cells and stimulate those cells to overproduce and release thyroid hormones.¹⁹

Diagnosis and Management of Graves' Disease

The diagnosis of Graves' disease is made based on signs, symptoms, and the result of the ancillary laboratory tests.²⁰ Besides physical examination diagnosis is also based on history and thyroid function tests. Serum TSH measurement is the best test because TSH is suppressed in hyperthyroid patients except in the rare instance when the aetiology is a TSH-secreting pituitary adenoma or pituitary resistance to the normal inhibition by thyroid hormone.²¹ According to Measurements of serum levels of TRAB and thyroid ultrasonography represent the most important diagnostic tests for Graves' disease. Despite the development of highly sensitive tests for thyroid disease, thorough clinical assessment of patients with suspected hyperthyroidism remains paramount.²² The measurement of serum TSH-receptor antibodies may be helpful in confirming the diagnosis of Graves' disease. These antibodies, positive in 90% of patients with presumed Graves' disease, are measured as TSH-receptor binding (TBII) and stimulating antibodies (TSI), the latter reflecting the effect on thyroid function.²³ Once it has been established that the patient is hyperthyroid and the cause is Graves' disease, the patient and physician can choose between three effective and relatively safe initial treatment options:

- RAI (Radioactive Iodine Therapy);
- ATDs (anti-thyroid drugs), or;
- thyroidectomy.²⁴

Hyperthyroid disease can be treated definitively for most patients. Palliative therapy with β -adrenergic blockade is useful in some patients. Further studies are needed to determine whether more recently described treatments have improved efficacy and whether therapy directed specifically at the underlying immunologic cause of Graves' disease can be used successfully.²⁵ Radioiodine is the preferred method to treat Graves' disease; however, recent data concerning treatment with a combination of propylthiouracil and thyroxine require further evaluation to establish its efficacy. Radioiodine is also the preferred treatment for the other forms of hyperthyroid disease; however, patient-specific considerations in both may require patient-tailored therapies.²⁶

Ayurvedic Interpretation, classification and pathology

According to Ayurveda a healthy person is he whose humours and metabolic state are in equilibrium, whose functional activities of the tissues and excretory products (i.e. the physical state) are in balance, and the soul, senses and mind (i.e. the mental state of the body) feel well.²⁷

Susruta Samitha describes the functions of three *doshas* or principles of the body: *vata*, *pitta* and *kapha*. These three principles are responsible in the physiological as well as the pathological states for all the biochemical and biophysical activities going on in the *dhatu*s (tissues).²⁸

Caraka Samhita states that *vata dosha* has six properties or qualities: roughness, lightness, coldness, hardness, coarseness and non-sliminess.²⁹ A brief review on the qualities of *vata dosha* gives: *Vata*: represents the elements of space and air. Its qualities are quick, light, cold, dry, rough, subtle, mobile, erratic, and dispersing.³⁰ When imbalance, *vata* tends to emaciate the body's tissues, causing osteoporosis, weight loss, or thinning air. Imbalance *vata* moves thoughts quickly through the mind, so we absorb information quickly but then forget it quickly. Our physiology runs fast under the influence of *vata*, and you can become fatigued, especially if we force our body to keep up with this level hyperactivity day after day. Have you noticed that these symptoms of *vata* imbalance are also characteristics of thyroid imbalance? This hyperactivity is a recipe for adrenal burnout and is the first step toward thyroid weakness. The endocrine glands cannot handle that amount of intense activity. In the early stages, *vata* aggravation and hyperactivity can push the thyroid gland into a hyperthyroid (or over-active state) and become hypothyroid (or underactive) and unable to produce enough hormones.³¹ According to Ayurveda the endocrine system is part of *majja dhatu* (nerve tissue and bone marrow) and it is connected to *majja vaha srotas* (the nervous system) and *mano vaha srotas* (the mental faculty and psycho-neuro system).³² The endocrine glands produce chemicals, called hormones, that directly enter into the bloodstream or lymph system. These hormones have their effects upon the vital organs and they even affect the metabolic activity and blood chemistry. These hormones act at both the cellular and systemic level. Hence they are similar to the Ayurvedic concept of *agni*, the digestive fire. This digestive fire is the fire element that regulates temperature, performs digestion, absorption, and assimilation of ingested food, and transforms food into energy or consciousness.³³ As Dr Vasant Lad also describes, the thyroid gland helps to regulate body temperature, heart rate, and protein production. It produces calcitonin, which along with the parathyroid glands, regulates the amount of calcium in the blood. There is a temperature regulating centre in the hypothalamus (*murdhni agni*) that stimulates the pituitary gland to produce TSH. In Ayurvedic literature, this TSH is called *jatru agni*,¹ and it is the bridge between *jathara agni*,² *bhuta agni*,³ and *dhatu agni*.⁴ The thyroid gland controls the body's metabolic activity, which in Ayurvedic terminology is the bodily *agni*. There are 13 main types of *agni* in the body: *jatha agni* (in the gastrointestinal tract), five *bhuta agni* in the liver, and seven

¹ The fire component present in the thyroid gland. It is the bridge between *bhuta agni* and *dahtu agni*.

² The central fire of the digestive system, responsible for digestion and assimilation of ingested food. It nourishes all the bodily *agni*.

³ The fire component of the five elements based in the liver, which manifests as the liver enzymes. It converts the five elements present in ingested food into biologically available forms of the elements that can be utilized by the body.

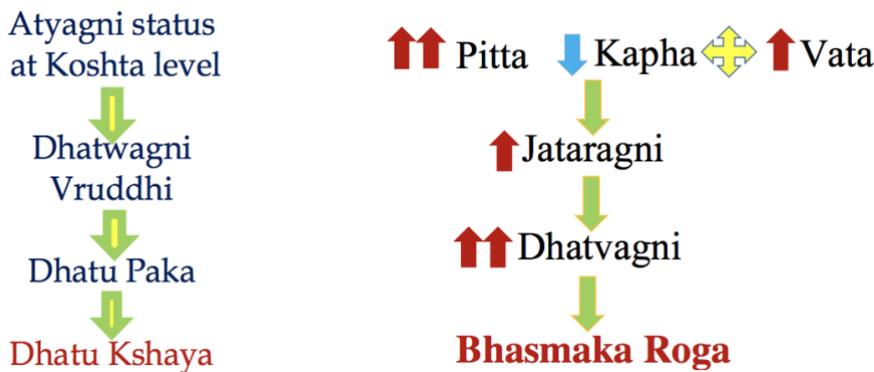
⁴ The *agni* component of each *dhatu*, located in the membrane that separates one *dhatu* from another.

dhatu *agni* in the bodily tissues. All these types of *agni* are governed by the pituitary gland via the thyroid gland, through the mechanism of thyroid stimulating hormone (*jatru agni*). Graves' disease occurs when the thyroid gland produces too many thyroid hormones, which is a condition of **high *jatru agni***, resulting in fast metabolism, protruded eyes, and strong appetite.³⁴ Dr. Varma and Dr Pawar also state that *Ayurveda* has described an important factor of digestion and metabolism in our body as *Agni*. Ingested food is to be digested, absorbed and assimilated, which is unavoidable for the maintenance of life, and is performed by *Agni*. In *Ayurveda*, the term "*Agni*" is used in the sense of digestion of food and metabolic products. *Agni* converts food in the form of energy, which is responsible for all the vital functions of our body.³⁵ As the *Caraka Samhita* states: "Life-span, complexion, strength, health, enthusiasm, corpulence, lustre, immunity, energy, heat processes, and vital breath-all these depend on body fire. One dies if this fire is extinguished, lives long free from disorders if it is functioning properly, gets ill if it is deranged, hence *Agni* (digestive fire) is the root cause of all."³⁶

Ayurvedic Classification of disease

Ayurvedic texts have adopted multiple approaches to the classification of diseases. *Caraka* while choosing a binary classification in *Vimana sthana* declares that the classifications may be numerable and innumerable basing on the criteria chosen for such classification. *Caraka* gives full liberty to the individual to go in for the newer and newer classification, provided the criteria are different. Taking cue from this statement an attempt has been made at categorizing the diseases mentioned in *Ayurvedic* texts under different systems in keeping with the current practice in the Western Medical Sciences.³⁷ There is no exact correlation of thyroid gland in *Ayurveda*. and it doesn't emphasize on naming the disease.³⁸ We cannot find any disease explained in *Ayurveda* which can be compared to hyperthyroidism. Understanding of hyperthyroidism in an *Ayurveda* language is done by inferential knowledge.³⁹ Inference is indirect knowledge gained through reasoning. For example, the state of *agni* can be inferred based on a person's appetite and the power of digestion.⁴⁰ Since the main action of thyroid hormone is to act as a spark to start-up body metabolism at cellular level. In *Ayurveda*, it can be correlated with the actions of *agni*. The *agni* located in the *jathara* (digestive fire) is responsible for digestion and absorption of the food. The *bhutagni* is responsible for transformation of heterogeneous substance to homogenous substances. The *dhatwagni* (the *agni* located in the body tissues) along with *bhutagni* are responsible for the metabolism. Also, the symptoms of hypothyroidism and hyperthyroidism can be correlated with imbalanced *doshas*.⁴¹ Hyperthyroidism is related with high metabolism and its consequences.⁴². Considering various factors, it can be compared with *Atyagni* or *Tikshnagni* or *Bhasmaka Roga* (related to increased *agni*) as all of them have affect the body's metabolism. *Bhasmaka Roga* is

caused by *Atyagni* or *Tikshnagni*. *Tikshnagni* is due to *Pittaprakopa*⁵. Symptoms of *Pittaprakopa* are similar to *Bhaskama Roga*.⁴³ *Caraka Samitha* states that there are forty disorders of pitta.⁴⁴ *Tikshnagni agni* is associated with excess pitta. Pitta's light, hot, sharp, spreading, and subtle qualities normally support *agni* but in excess, they can inflame it—triggering the overactive, hypermetabolism that characterizes *tikshna agni*.⁴⁵ This is a key event in the pathogenesis of hyperthyroidism.⁴⁶ *Bhaskama roga* is excessively increased status of *Jataragni* in turn *Dhatwagni* due to excessively aggravated Pitta which is associated with increased *Vata* and decreased *Kapha*. *Bhaskama roga* can be correlated to Graves' disease. Here the *Agni* will be so strong so as to digest any amount of *Guru Ahara* very quickly. In the absence of *Ahara* it starts digesting the *Dhatus* leading to *Krishata* due to *Dhatu Paka* which explains the presentation of increased BMR.⁴⁷



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Schematic representation Samprapti of Bhaskama Roga

Senior Professor Dr. S.N. Ojha sir has compared hyperthyroidism with the following other conditions besides *Tikshnagni* and *Bhaskama Roga*:

- *Samanavrita Udana*
- *Pittavrita Udana*

In the condition of hyperthyroidism, the symptoms and diseases pertain to many tissues (*dhatu*s), channels (*srotas*) and organs:

- *Rasa dhatu* and *Rasavaha srotas*;
- *Mamsa dhatu* and *Mamsavaha Srotas*;
- *Medu dhatu* and *Medovaha Srotas*;
- *Asthi dhatu* and *Astivaha Srotas*;
- *Majja dhatu* and *Majjavahaha Srota*;
- *Shukra dhatu* and *Shukravaha Srotas*;
- *Purishavaha Srotas*;

⁵ Aggravation of *pitta* qualities

- *Svedavaha Srotas*;
- *Annavaha Srotas*;
- *Pranavaha Srotas*;
- *Manovaha Srotas*.

Samanavrita Udana

Samanavrita Udana is a condition in which *samana vata*, when aggravated, blocks the *udana vata* located in the region of thyroid gland. The strong *samana vata* will surround and envelope the *udana vata* and disturbs its functions. Due to the severity of *samana vata*, the digestive fire in the stomach will get too intense. The combination of severe *vata* and *pitta* with deterioration of *kapha* will lead to heated up environments in the stomach. This will have an influence on the fires of all the tissues and elements in the body. All these events will eventually lead to agitated metabolism. This enhanced *samana vata* associated with the heat of digestive fire will towards and hit *udana vata* located in the chest and throat regions. The disturbed and agitated *udana vata* in an attempt to overcome the attack from *samana vata* will express itself in excessive way. The thyroid gland located in the region of *udana vata* will produce excessive thyroid hormones. This leads to manifestation of symptoms similar to those of hyperthyroidism.⁴⁹

A review of *samana vata* and *udana vata* in the *Sushruta Samhita*, Chapter 1 of *Nidana-sthanam* states that: *Samana vayu* is that which circulates in the stomach and intestines. It is associated with the metabolic fire (digestive juice and enzymes). It digests food and specially separates their end products. It causes abdominal swelling, indigestion, diarrhoea etc. *Udana vayu* is that *vayu* which travels upward and is the best among the *vayus*. Speech, songs etc. are specially initiated by the same. And it produces diseases specifically of structures above the clavicle (head and neck).⁵⁰

Pittavrita Udana

Pittavrita Udana is a condition where aggravated *pitta* envelopes *udana vata* and disturbs its functions. When *pitta* influences *udana vata*, initially the *udana vata* is blocked and later due to over provocation of *udana vata* with or without the presence of *pitta* will cause the thyroid gland to produce more thyroid hormones. The seat of *udana* is also the primary seat of *kapha*. Due to influence of *pitta* and *vata* there is deterioration of *kapha*. Increased *vata* and *pitta* associated with decreased *kapha* marks the events leading to exaggerated metabolism as occurs in hyperthyroidism.⁵¹

Summary of Cause (*Nidana*), Symptoms (*Rupa*) and Pathogenesis (*Samprapti*) of Hyperthyroidism

Nidana: A condition of primary *vata-pitta* nature, hyperthyroidism is brought about by excess travel, over-stimulation, anxiety, anger, spicy foods, intensity and / or burn out.

Rupa: Common signs and symptoms included in Table 1.

Table 1:

Goiter (galaganda)
Tachycardia
Widened pulse pressure
Excess warmth
Moist skin
Tremors
Atrial fibrillation
Nervousness
Hypersensitivity to heat
Palpitations
Fatigue
Increased appetite
Weight Loss
Insomnia
Weakness
Increased bowel movements
Pretibial infiltrative dermopathy
Visual disturbances
Eye Pain
Bulging Eyes
Stare
Lid Lag
Hypermenorrhoea

Pathogenesis: The hypermetabolic state creates a combination of excess motion and heat. *Vata* accumulates and becomes aggravated in the *purishavaha srotas*, overflows to the *rasa* and *rakta dhatus* and relocates, manifests and diversifies in the *rasavaha srotas* where it affects the thyroid gland. *Pitta* accumulates and becomes aggravated in the *annavaha srota*, overflows to the *rasa* and *rakta dhatus* and relocates, manifests and diversifies in the *rasavaha srota* where it too affects the thyroid gland. Secondary important sites of relocation include the *raktavaha* and *majjavaha srotas*.⁵²

Ayurvedic Management of Graves' disease

Ayurveda rather insists on understanding the constitutional status of a disease and adopting an appropriate treatment principle.⁵³ From Ayurvedic point of view it is imperative to understand that whatever the disease or symptoms may be – hair loss, arrhythmias, weight gain, fatigue,

hyperthyroidism, hypothyroidism, Hashimoto's or Graves' disease, even thyroid cancer – we must first consider the balance of the three *doshas*. If you treat the symptoms without balancing the three *doshas*, the results will be minimal and temporary.⁵⁴

Though the exact terms of all the diseases of thyroid disorders are not described in Ayurveda, the signs and symptoms produced due to thyroid dysfunction is described in Ayurveda under its classical terms. And pathophysiology of all those diseases lies in the concept of *agni* as *agni* is said to be the prana (life) of the living body. Vitiations of *doshas* also depends on vitiations of *agni* that is why for bringing doshas in balanced state, treatment of *agni* is done. Hence in the diagnosis and treatment of any diseases maximum consideration is given to the preservation/protection of *agni*.⁵⁵ The *Shastras*, the ancient texts of Ayurveda, state that the first steps toward ill health begin with poor diet and daily routine. So to prevent any disease, it is first and foremost recommended to eat healthy diet and early bedtime in the treatment protocols.⁵⁶ The dietary rules and proper lifestyle (*Dinacharya and Ritucharya*) as described in Ayurvedic texts should be followed for proper control of Hyperthyroidism. Ayurveda has advised three fundamental modalities to manage every disease i.e. *Nidana Parivarjana, Samsodhana Chikitsa and Samshaman Chikitsa*.

1. *Nidana Parivarjana*: Avoidance of the various causative factors of the disease is called *Nidana* disease. Hyperthyroidism manifests as a result of *Pitta-Vatavridhi* and *Tikshnagni*. Therefore, all the *Pitta-Vatadosha* aggravating and *Tikshnagnikaraka ahaara-vihaara* should be avoided in Hyperthyroidism.
2. *Shamsamana Chikitsa*: Mahatikta ghrī and Ksheerabala (a preparation of *Sida cordifolia* in milk), were found to be effective of both the genders and different conditions of thyroid disorders including hyperthyroidism.
3. *Samshodhana Chikitsa*: Mild medicated with *Nishoth* and *Trivrit* may be advised for *virechana* for alleviating the pitta followed by diet of milk pudding.⁵⁷

Furthermore, patients need to learn to rest and relax more, avoiding excess stimulation. As this is often what brought the condition on and as such, these patients find it difficult to slow down. While deep rest is, what is needed, it is also what is the hardest to find. Retreat is often necessary to remove all stimulation. A couple of weeks at a *pancha karma* center receiving rejuvenative oil therapies and performing gentle yoga can be very beneficial. Excessive *pranayama*, chanting and intense *asana* are not advised.⁵⁸ Yoga therapy for the *Vishuddha* or fifthhh throat chakra helps to heal the thyroid gland. Chanting of "Om" while meditating balances thyroid function. Sheetalī, Sheetkari, Nadi Shodhan, Bhramari, and Ujjayi Pranayama, and practice of asana like Suryanamaskar at slow pace, shoulder stand (*sarvangasana*), plough (*Halasana*), fish (*Matsyasana*), and lion poses are beneficial.⁵⁹

Walks should be encouraged but no running. Herbs may be used to decrease the activity of the thyroid gland. It is also beneficial to increase the intake of foods that suppress thyroid function.

These are primarily raw cruciferous vegetables and radishes. If goiter is present with the patient, a

paste may be applied to the enlarged gland. Classical text recommends a paste prepared from ashwaghandha, bibhitaki and / or radish. Radishes contain high level of isothiocyanates known to suppress the thyroid function. Important herbs for managing hyperthyroidism are:

- Bugleweed (*Lycopus europaeus*)
- Lemon Balm (*Melissa Officianale*)
- Verbena (*Brassica oleracea*)
- Cruciferious vegetables
- Self Heal.⁶⁰

Table 2 shows the plants that act on Hyperthyroidism.

Concluding Remarks

Ayurveda is based on *Sankhya* philosophy, which includes the concept of *karya karana bhava*, meaning the effect exists within the cause in an unmanifested form. Every cause has a definite effect. Cause is a concealed effect, while effect is a revealed cause. For that reason, *nidana* or etiology, the study of the causes of disease, is most important. By knowing the cause of the disorder, you can understand its nature. Ayurveda gives us a profound overview of how various causes can lead to disease. These include poor diet, wrong lifestyle or job, inappropriate relationships, incompatible environment, bacteria, viruses, parasites and many others. Disease is born within the womb of *khhavaigunya* (weak space in the body), but to create that baby there must be some external or internal cause.⁶¹ Ayurveda always stresses that if you will not find the name of particular disease in texts, in such a situation fit all the symptoms of that disease in its basic principles and then only treat as per Ayurvedic principles of treatment. So, it can be concluded that by understanding thyroid disorder from Ayurvedic perspective, can give safe and effective management and healthful longevity.⁶² While there is a high prevalence of thyroid conditions, they are treatable. Everybody's individual circumstance is different and treatments will differ according to individual circumstances. Ayurvedic techniques are designed to get to the root cause of all problems.⁶³

Table 2: Showing plants that act on Hyperthyroidism

Plant	Anti thyroid activity
<p><i>Melissa officinalis</i> L. Family: <u>Lamiaceae</u> [23]</p>	<p>As noted in the older studies, lemon balm is effective in blocking the binding of TSH to the receptor by acting on the hormone and the receptor itself. It also inhibits cyclic AMP production stimulated by TSH receptor antibodies. Traditionally, lemon balm has been used to treat symptoms associated with hyperthyroidism, like tachycardia, insomnia, and hyperactivity.</p>
<p><i>Convolvulus pluricaulis</i> Choisy. Family: Convolvulaceae [24]</p>	<p><i>Convolvulus pluricaulis</i> acts strongly on some of the liver enzymes and helps in improving symptoms of hyperthyroidism. It has antiulcer properties and is helpfulness in alleviating the symptoms of hyperthyroidism. The studies on <i>C. pluricaulis</i> have also put forward that it is beneficial in remedying hypothyroidism.</p>
<p><i>Leonurus cardiaca</i> L. Family: <u>Lamiaceae</u> [23]</p>	<p>In autoimmune diseases, it is important to reduce inflammation, making motherwort a good choice in treating hyperthyroidism. In addition to reducing inflammation, the enzyme 5-deiodanase is inhibited.</p>
<p><i>Annona squamosa</i> L. Family: Annonaceae [25]</p>	<p>The aqueous leaf extract of <i>A. squamosa</i> was also reported to ameliorate hyperthyroidism, which is the major causative factor for diabetes mellitus.</p>
<p><i>Rauvolfia serpentina</i> L. Benth .ex Kurz. Family: Apocynaceae [26]</p>	<p>The <i>R. serpentina</i> root extract administered to T₄ induced hyperthyroid mice significantly decreased both the serum T₃ and T₄ concentrations.</p>
<p><i>Emblica officinalis</i> Gaertn. Family: Phyllanthaceae [27]</p>	<p>The fruit extract decreased both serum T₃, T₄ concentrations. The decrease in T₃ was by inhibiting peripheral conversion of T₄ to T₃ in extra-thyroid tissues.</p>
<p><i>Trigonella graceum</i> L. Family: Fabaceae [28]</p>	<p>The seed extract induced reduction in T₃ level could be the result of inhibition in peripheral conversion of T₄ to T₃ in extra thyroidal tissues.</p>
<p><i>Aegle marmelos</i> (L.)Correa Family: Rutaceae [29]</p>	<p>The plant has a specific role in the regulation of thyroid functions and in maintaining the Thyroid hormone levels..</p>
<p><i>Ocimum sanctum</i> L. Family: Lamiaceae [3]</p>	<p>The leaf extract of <i>O. sanctum</i> administered to male mice for significantly inhibited only T₄ concentration.</p>
<p><i>Moringa oleifera</i> auct.non Lam Family: Moringaceae [30]</p>	<p><i>M. oleifera</i> leaf extract treatment of female rats decreased serum T₃ concentration and increased in serum T₄ concentration .This observation suggests the inhibitory activity of the plant extract in the peripheral conversion of T₄ to T₃.</p>

Endnotes:

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- ¹ Dr. Geeta K. Varma and Dr. Jatved J. Pawar, "A review on Ayurvedic perspective of thyroid disorders", *International Journal of Development Research* Vol. 06, (August 2016), 8916-8919.
- ² Dr. Marc Halpern, *Clinical Ayurvedic Medicine*, 6th Edition (Nevada City, College of Ayurveda, 2012): 7-5.
- ³ Ibid, 7-6 to 7-7.
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Abstracts for Review of Graves' disease, Western and Ayurvedic Perspective

Journal: International Journal of Development Research August 2016; 6; 8: 8916-8919

Title: A review on ayurvedic perspective of thyroid disorders

Author: Dr. Geeta K. Varma and Dr. Jatved J. Pawar

Abstract:

Thyroid gland disorders are growing worldwide health issue. Thyroid hormone regulates metabolic rate of the body. Failure of thyroid hormone to maintain metabolic rate mainly produces hyperthyroidism or hypothyroidism. Thyroid disorders are characterized by physical and mental abnormality. There is no exact correlation of thyroid gland in Ayurveda. But the Ayurvedic system of medicine is very futuristic and it doesn't emphasize on naming the disease. It rather insists on understanding the constitutional status of a disease and adopting an appropriate treatment principle. The main action of thyroid hormone is to act as a spark to start-up body metabolism at cellular level. In Ayurveda, it can be correlated with the actions of *agni*. The *agni* located in the *jathara* (digestive fire) is responsible for digestion and absorption of the food. The *bhutagni* is responsible for transformation of heterogeneous substance to homogenous substances. The *dhatwagni* (the agni located in the body tissues) along with *bhutagni* are responsible for the metabolism. Also, the symptoms of hypothyroidism and hyperthyroidism can be correlated with imbalanced *doshas*. These concepts of *Ayurved* could be considered to understand thyroid disorders from ayurvedic perspective. As modern treatment has many adverse effects, it is important to understand thyroid disorders from Ayurvedic perspective to give safe and effective Ayurvedic management.

Journal: The New England Journal of Medicine October 26, 200;343;17:

Title: Graves' Disease

Author: Anthony P. Weetman

Abstract:

ROBERT Graves' first identified the association of goiter, palpitations, and exophthalmos in 1835, although Caleb Parry had published details of a case 10 years earlier. The discovery of a thyroid-stimulating factor that was not thyrotropin in the serum of patients with Graves' hyperthyroidism¹ was followed by the identification of this stimulator as an IgG antibody.² It is now clear that Graves' hyperthyroidism is caused by these thyroid-stimulating antibodies, which bind to and activate the thyrotropin receptor on thyroid cells.³ Graves' disease also affects the eyes (Graves' ophthalmopathy) and the skin (localized dermatopathy or myxedema), but the causes of these less common components of the disease are not known.

Journal: The Indonesian Journal of Internal Medicine April 2018, 50;2: 177-182

Title: Current Diagnosis and Management of Graves' Disease

Author: Imam Subekti, MD., PhD

Abstract:

Graves' disease is an autoimmune disorder which affect thyroid gland. Graves' disease is the most common cause of hyperthyroidism and thyrotoxicosis. Understanding of disease pathophysiology, diagnostic and treatment strategies, and prevention of disease relapse are important for all clinicians especially internal medicine specialist to give optimal and comprehensive management for Graves' disease patients. This article highlights clinical points to treat Grave's disease patients from reviews and latest guidelines from American Thyroid Association (ATA), European Thyroid Association (ETA), and Japan Thyroid Association/ Japan Endocrine Society.

Journal: Therapeutic Advances in Endocrinology and Metabolism 2011, 2;3 135-144

Title: Current concepts in Graves' disease

Author: Christian M. Girgis, Bernard L. Champion and Jack R. Wall

Abstract:

Graves' disease is the most common cause of hyperthyroidism in the developed world. It is caused by an immune defect in genetically susceptible individuals in whom the production of unique antibodies results in thyroid hormone excess and glandular hyperplasia. When unrecognized, Graves' disease impacts negatively on quality of life and poses serious risks of psychosis, tachyarrhythmia and cardiac failure. Beyond the thyroid, Graves' disease has diverse soft-tissue effects that reflect its systemic autoimmune nature. Thyroid eye disease is the most common of these manifestations and is important to recognise given its risk to vision and potential to deteriorate in response to radioactive iodine ablation. In this review we discuss the investigation and management of Graves' disease, the recent controversy regarding the hepatotoxicity of propylthiouracil and the emergence of novel small-molecule thyroid-stimulating hormone (TSH) receptor ligands as potential targets in the treatment of Graves' disease

Journal: Ancient Science of Life 1993, 12;3,4 338 - 350

Title: A systematic approach to the classification of diseases

Author: A.R.V. Murphy

Abstract:

Ayurvedic texts have adopted multiple approaches to the classification of diseases. Caraka while choosing a binary classification in Vimana sthana declares that the classifications may be numerable and innumerable basing on the criteria chosen for such classification. He gives full liberty to the individual to go in for the newer and newer classification, provided the criteria are different. Taking cue from this statement an attempt has been made at categorizing the diseases mentioned in Ayurvedic texts under different systems in keeping with the current practice in the Western Medical Sciences.

Journal: European Journal of Pharmaceutical and Medical Research 2018, 177-182

Title: Management of Graves Disease with special reference to Bhasmaka Roga

Author: Rao Veena G, P. Seethadevi, and H. S. Vatsala

Abstract

Bhasmaka roga is excessively increased status of Jataragni intum Dhatwagni due to excessively aggravated Pitta which is associated with increased Vata and decreased Kapha. Hyperthyroidism is a metabolic disorder characterised by excessively circulating free thyroid hormone in the blood. i.e. Increased or normal T3, T4 levels with decreased TSH levels. Bhasmaka roga can be correlated to Grave's disease. Hyperthyroidism is not so common with an incidence of 0.4 per 1000 women and 0.1 per 1000 men with ratio 10:1 respectively. The Main function of thyroid gland is to maintain proper metabolism, growth, basal temperature and sinus rhythm which can be attributed to the functions of Prakruta Vata and Pitta. Vagbhata's explanation on this correlates with increased BMR causing weight loss which is prime factor in both Bhasmaka roga and Hyperthyroidism. In this condition, the treatment should be aimed towards Kapha Vruddhi Kara, Vata and Pitta Shamana, which helps in bringing back the increased Jataragni and Dhatvagni to normalcy. This was a single case report on a patient of primary hyperthyroidism (Grave's disease), who was administered with Vidaryadi Ghrita and Drakshadi Kashaya as Shamana Oushadi for a period of 2 year. The objective and subjective parameters were assessed before and after treatment. The results were encouraging with significant improvement. Hence this treatment can be effectively adopted in patients of hyperthyroidism i.e. Bhasmaka roga.

Journal: International Journal of Ayurveda and Integrative Medicine, 2021 2;1, 74-79

Title: A review of Hyperthyroidism

Author: Sirjana Shrestha

Abstract:

Hyperthyroidism is one of the most common disorder of Thyroid gland which is increasing day by day globally especially in developing countries. Ayurvedic classics have no direct reference of Hyperthyroidism. Considering various factors, it can be compared with *Atyagni* or *Tikshnagni* or *Bhasmaka Roga* (related to increased agni). Approximately 300 million people worldwide are affected by thyroid dysfunction as it is a common endocrine disorder. Globally about 1-5% population are affected by hyperthyroidism. The prevalence of thyroid disorders in Nepalese population is 4.32% and among them 13.7% population has Hyperthyroidism. Available treatments of Hyperthyroidism in contemporary medicine cause lots of adverse effects and complications in the long run. So, it is very necessary to find out an effective alternative treatment for hyperthyroidism. Therefore, this study was an attempt to get the understanding of disease Hyperthyroidism as per Ayurveda through various Ayurvedic principles so as to set its management strategies.