

## UNDERSTANDING HYPOTHYROIDISM IN AYURVEDA

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## ABSTRACT

Hypothyroidism refers to deficiency of thyroid hormone caused due to various reasons. The global incidence of hypothyroidism is increasing alarmingly as people are exposed to more stress and strain. The synthesis and transport of thyroid hormones play a vital role in the normal physiology and functioning of thyroid hormones. HPT axis with its negative feedback mechanism helps in maintaining normal hormone levels. The level of TSH is the primary indicator of hypothyroidism and a thorough evaluation is needed to know the pathology behind before starting hormone supplementation therapy. Hashimoto's Thyroiditis and Autoimmune Thyroiditis are the two main pathogenesis involved in the manifestation of hypothyroidism. While analysing the signs and symptoms of hypothyroidism in Ayurvedic view, we note the involvement of all *Srotas*. The *Kapha dosha* and *Vata dosha vruddhi* is elicited and *Pitta dosha kshaya* is seen. Though some physicians consider it as a *Sthanika vyadhi* under *Galaganda roga*, it's *Dushti lakshanas* are seen in whole body. Here an attempt is made to understand Hypothyroidism as a syndrome from Ayurvedic point of view.

**Key words:** Hypothyroidism, HPT axis, TSH, Hashimoto's thyroiditis, Autoimmune thyroiditis, *Kapha dosha vruddhi*, *Vata dosha vruddhi*, *Pitta kshaya*, *Galaganda*

## INTRODUCTION

Hypothyroidism refers to any state that results in a deficiency of thyroid hormone, including hypothalamic or pituitary disease and generalized tissue resistance to thyroid hormone and disorders that affect the thyroid gland directly<sup>i</sup>. The global incidence of hypothyroidism is increasing as the thyroid gland easily responds to stimuli like stress and anxiety. Recent statistical study reveals that the iodine deficiency is the most common cause of hypothyroidism. According to World Health Organisation, 2 billion people are iodine deficient worldwide<sup>ii</sup>. The relative iodine deficiency causes Goiter and severe deficiency causes

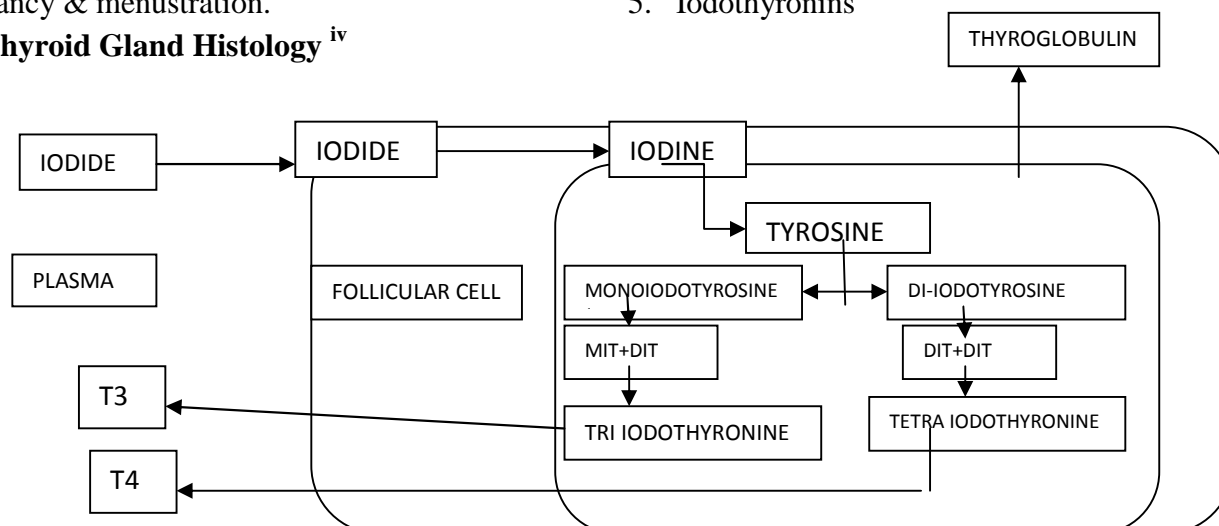
Hypothyroidism & Cretinism. On the otherhand oversupply of iodine results in autoimmune thyroid disease. Hypothyroidism (congenital) occurs 1 in 4000 newborns worldwide whereas in India it is 1 in 2640 newborns. Females are more affected than males (6:1 ratio). Whites and Asians are more affected population. 80% of all Thyroid disease is diagnosed as Hypothyroidism.

**Thyroid Gland Anatomy<sup>iii</sup>**

Thyroid gland is an endocrine gland situated in the lower part of the front & sides of the neck. It lies anterior to trachea between the cricoid cartilage & suprasternal notch. It consists of two lobes connected

by isthmus weighs 12-20gm (5cm x 2.5 cm x 2.5cm). It is a highly vascular deep neck structure which is soft in consistency and lies against C5, C6, C7, T1. The arterial supply is from superior & inferior thyroid arteries which are in turn supplied by external carotid and subclavian arteries respectively. The venous drainage is into superior, middle and inferior thyroid veins which drain into Internal jugular vein and Brachiocephalic vein. Lymph drains into deep cervical lymph nodes. Nerve supply is from middle, superior and inferior cervical ganglion. Along with thyroid gland there are 4 parathyroid glands which are located at the four posterior poles of thyroid gland. Thyroid gland is larger in females and increases in size during pregnancy & menstruation.

#### Thyroid Gland Histology <sup>iv</sup>



#### Transport of Thyroid hormones in blood

The 80 % of thyroid hormones are transported by Thyroxine binding globulin and 10% by Albumin and Transthyretin (Thyroxine binding prealbumin) respectively.

Any defect in the stages of synthesis or transport of thyroid hormones will eventually result in Hypothyroidism.

#### Functions of Thyroid Hormones <sup>v</sup>

- Growth & development- for normal axonal & dendritic development mye-

Thyroid gland consists of numerous spherical follicles composed of thyroid follicular cells. Colloid, a proteinaceous fluid containing large amounts of thyroglobulin which is the protein precursor of thyroid hormones. The follicular cells secrete Triiodothyronin T3 & Tetraiodothyronin(Thyroxine) T4. In between follicular cells, the parafollicular cells are present, which secrete calcitonin. T3 & T4 are iodine containing derivatives of amino acid tyrosine.

#### Synthesis of Thyroid hormones

It consists of mainly 5 steps viz.,

1. Thyroglobulin secretion
2. Iodide pump
3. Oxidation of Iodide
4. Iodination of Tyrosine
5. Iodothyronins

lination & linear growth with maturation of growing epiphyseal end plates.

- Energy Metabolism- stimulates BMR, oxygen consumption & heat production.
- Nervous system-It regulates nervous system activity by exerting effect on adrenergic receptors.
- Heart- T3 maintains normal myocardial contractility.
- Muscle- normal skeletal muscle function is regulated.

- Respiratory system- Lung volume and breathing capacity is maintained
- Skin-Normal cutaneous circulation & secretion of glands.
- Colon- helps in controlling normal bowel movements.
- Vitamins- increases utilization & clearance of vitamins.
- Carbohydrate metabolism -stimulates absorption of glucose from intestine.
- Protein metabolism- increases the synthesis of proteins in the cells.
- Fat metabolism- decreases fat storage by mobilizing it and converting in to free fatty acid.
- Action on sleep – Hyposecretion of hormone causes excess sleep and hypersecretion causes sleeplessness.
- Action on sexual function – helps in normal sexual development & reproductive function.

#### **HPT AXIS**

Hypothalamo- Pituitary- Thyroid axis regulates the secretion of Thyroid hormones by the negative feed back mechanism. Hypothalamus secretes Thyrotropin releasing hormone (TRH) which stimulates Anterior pituitary which in response secretes Thyroid Stimulating hormone (TSH). TSH stimulates Thyroid gland to secrete Thyroid hormones T3 & T4. When the level of T3 & T4 exceeds the normal limit, it send negative feedback to Anterior

pituitary which inturn reduces the secretion of TSH.

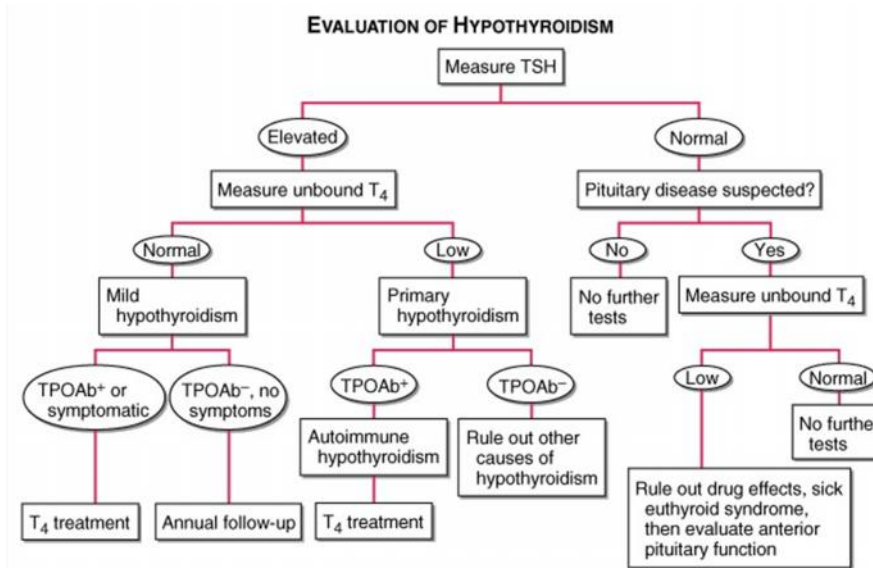
**Pathogenesis of Hashimoto's Thyroiditis<sup>vi</sup>:** The Lymphocytic infiltration in thyroid follicles causes the germinal centre formation. The atrophy of follicles results in oxyphil metaplasia. The absence of colloid matter and fibrosis happens which eventually leads to Atrophic thyroiditis.

**Pathogenesis of Autoimmune hypothyroidism<sup>vii</sup>:** The pathogenesis of autoimmune hypothyroidism is uncertain. Various hypothesis for etiological factors are combination of genetic and environmental factors, HLADR polymorphism, T cell regulatory gene, sex steroid effects, Immunological effects, Direct thyroid toxicity, congenital rubella infection, Thyroid lymphocyte infiltrate, Antibodies to Thyroglobulin and Thyroid peroxidase enzyme.

**Signs:** The signs of hypothyroidism include Dry &coarse skin ,Cool extremities, Myxedema, Diffuse alopecia, Bradycardia, Peripheral edema, Delayed tendon reflexes, Carpel Tunnel syndrome and Serous cavity effusions.

**Symptoms:** The symptoms of hypothyroidism include Tiredness, weakness, Dry skin, Feeling cold, Hair loss, Difficulty in concentrating, Poor memory, Impaired Hearing, Constipation ,Weight gain with poor appetite, Dyspnea, Hoarse voice, Menorrhagia and Paresthesia.

**Evaluation of Hypothyroidism when patients with above signs and symptoms**



**Level of TSH :** 0.0- Hyperthyroidism, 0.4- 2.5- Normal range, 2.6-4.0- At risk, 4.1-10.0- Hypothyroidism

**Treatment:** The modern treatment is hormone replacement therapy by Levothyroxine . The daily replacement is needed ie.1.6µg/Kg body weight( average 100-150µg. Levothyroxine is Synthetic T4 under brand names Levothyroid, Levoxyl, Synthroid, Tirosint, Unithroid, Thyronorm, Eltroxin, Cytomel, Thyrolar. The . **INVOLVEMENT OF TRIDOSHA**

treatment is accompanied with a host of side effects like High Blood Pressure, Infertility, Weight Loss, Impaired Diastolic function and exercise capacity, Increased Intima media thickness and Increased risk of coronary heart disease.

**ANALYSIS OF HYPOTHYROIDISM IN AYURVEDIC VIEW:** In Charaka Samhita, *Ashta nindita purushas* have been discussed which can be taken as functional disorders of endocrine gland.

	Symptoms involved	Dosha involved
1.	Weight Gain	Kapha vruddhi, Pitha kshaya
2.	Puffiness of body features	Kapha Vruddhi
3.	Loss of appetite	Kapha Vruddhi, Pitta Kshaya
4.	Dry & coarse skin	Vata Vruddhi, Pitta Kshaya
5.	Minimal or absent sweating	Pitta Kshaya
6.	Anaemia	Kapha-Vata Vruddhi, Pitta Kshaya
7.	Constipation	Vata Vruddhi
8.	Hoarseness of Voice	Kapha- Vata Vruddhi
9.	Generalised Aches, Pain	Vata Vruddhi
10.	Muscular cramps, stiffness	Vata Vruddhi

11.	Sluggishness	Kapha Vriddhi
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Kapha- Utkrishta Vriddhi, Vata- Alpa/Madhyama Vriddhi, Pitha- Utkrishta Kshaya

### Involvement of Dhātu

	Dhātu	Symptoms
1.	Rasa	Weight gain, Loss of appetite, Heaviness of body, Lethargy, Generalised aches, Somnolence, premature aging symptoms like hairloss, Cold intolerance, Puffiness, Anaemia, Menstrual disturbances, Infertility
2.	Rakta	Slow pulse rate, Dry skin, Slowing of mental activity, Lethargy
3.	Mamsa	Heaviness in the body, Muscle ache, granthi, Galaganda
4.	Meda	Tiredness, Sleepiness, sluggishness, Hyperlipidemia, Dyspnea on exertion
5.	Asthi	Osteoporosis, Osteoarthritis
6.	Majja	Osteoporosis
7.	Shukra	Loss of libido, infertility

### Involvement of Srotas

	Srotas	Symptoms
1.	Annavaḥa	Loss of appetite, malabsorption
2.	Rasavaḥa	Weight gain, Loss of appetite, Heaviness of body, Lethargy, Generalised aches, Somnolence, premature aging symptoms like hair loss, Cold intolerance, Puffiness, Anaemia, Menstrual disturbances, Infertility
3.	Raktavaḥa	Slow pulse rate, Dry skin, Slowing of mental activity, Lethargy, Anaemia
4.	Mamsavaḥa	Oedema, Galaganda
5.	Medovaḥa	Tiredness, Sleepiness, Sluggishness, Hyperlipidemia, Dyspnea on exertion
6.	Asthivaḥa	Osteoporosis, Osteoarthritis, Hair loss
7.	Majjavaḥa	Osteoporosis
8.	Shukravaḥa	Loss of libido, Infertility
9.	Purishavaḥa	Constipation
10.	Swedavaḥa	Dry & coarse skin, absent/minimal sweating

11. Artavavaha Loss of libido, Infertility, Secondary amenorrhoea

### Involvement of Agni in Hypothyroidism

आयुवेणो बलं स्वास्थ्य उत्साहो उपचयौ प्रभा ।  
ओजस्तेजो अग्नयः प्राणश्चोक्ता  
देहाग्नेहेतुकाः॥(च.चि.१७/३) *Dehagni* or  
*Jataragni* is the *raison de etre* of life, colour, strength, health, enthusiasm, plumpness, complexion, *Ojas, Tejas*, other varieties of *Agni* and *Prana*. Extinction of this *Jataragni* leads to death; its proper maintenance helps a person to live a long life, and its impairment gives rise to diseases.

आग्नेरेव शरीरे पित्तान्तगतः कुपेताकुपेतः  
शुभाशुभाने करोति; तद्यता – पाक्तेमपाक्ते

### दशनमदशन

मात्रामात्रत्वमूष्णःप्रकृतीवेकृतेवणौ शौये भयं  
क्रोध हर्षं मोहं प्रसादांमेत्येवमादौने चापराणे  
द्वन्द्वानीति॥ (च.सु.१२/११) It is *Agni* alone  
represented by *Pitta* in the body which brings about good or bad effects according to its normal or abnormal state, eg: digestion or indigestion, vision or loss of vision, normalcy or otherwise of bodily heat, normalcy or otherwise of complexion, valour and fear, anger and joy, bewilderment and happiness and such other pairs of opposite qualities.

जठराग्नि	<i>Ama</i> Development of autoimmunity
भूताग्ने	Iodine Selective trapping of iodide, transport, uptake by thyroid cells, organification
धात्वाग्ने	<i>Asthayi poshakamsha</i> of <i>dhatu</i> is vitiated. <i>Dhatwagni mandya</i>

धातुवृद्धि : स्वस्थानस्थस्य कायाग्नेरशा  
धातुषु सांश्रिता । तेषां सादातेदोप्ताभ्या धातु  
वृद्धे क्षयोद्ध :॥

पूर्वो धातुः परं कुयोत् वृद्धः क्षीणाश्च  
तद्वेधम्। (अ.ह.सु.११/३४): *Kayagni* present  
in its own place, has portions of itself, present in the *Dhatu*s also. Their decrease (in quantity, qualities or functions) and increase (in quantity, qualities or functions) give rise to increase and decrease of the *Dhatu*s (respectively). If preceding *Dhatu* is increased or decreased, it will increase or decrease the succeeding *Dhatu* too.

**Involvement of Ama:** *Annaroopa & mala sanchaya of ama* is present  
स्रोतोरुधबलभ्रशगौरवानेलमूढताः ॥२३॥

आलस्यापाक्तेरानेष्ठोवमलसगारुचेकलमाः।

(अ.ह. / )

The *Samadosha lakshanas* include obstruction of the channel, loss of strength, feeling of heaviness in the body, inactivity of *vata*, lassitude, loss of digestive power, more of expectoration, accumulation of wastes, anoexia, exhaustion Clinical presentation of hypothyroidism in cludes symptoms like lethargy, fatigue, heaviness in the body, sleepiness, loss of appetite.

### Samprapthi Ghataka

Dosha- Kapha vrudhi, pitta dushti, vata vrudhi

Dushya- all dhatus predominantly rasa, medha

Agni- Jatharagni, Dhatvagni

Ama- Jatharagni mandya janita, Dhatvagnimandya janita

Srotas- all srotas

Srotodushti- sanga, vimarga gamana

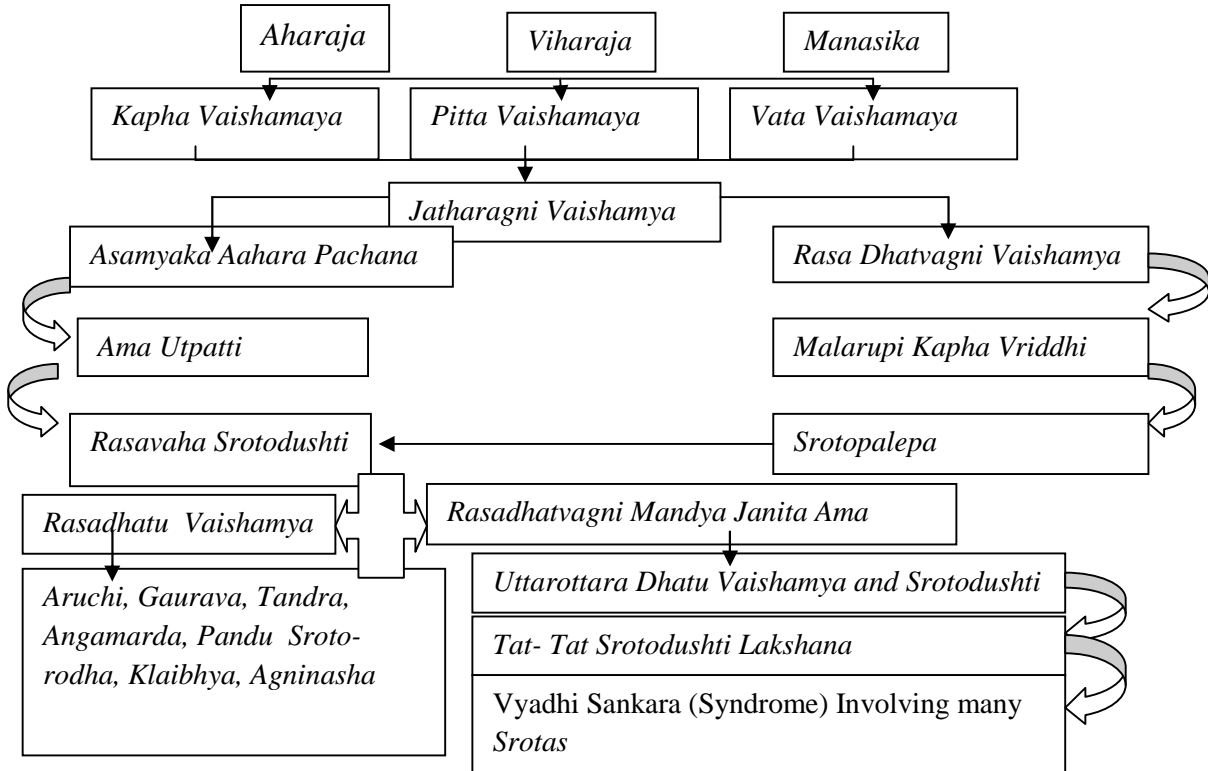
Adhishtana- gala pradesha

Udhbava sthana- Amashaya

Rogamarga- Bahya

Vyakta sthana- Sharira

### Samprapthi



**Nidan:** Vata Prakopaka Nidana, Kapha Prakopaka Nidana, Agni dushti hetu

**Galaganda:** Galaganda is defined as Swelling in neck region or enlargement of gland of neck. ( Shabdakalpadruma) According to Charaka, Galaganda is the enlargement at the neck region produced due to prevocated Kapha dosha. It is a Kaphaja nanatmaja vikara and Acharya Vaghbata included it under Mukha roga.

**Chikitsa of Galaganda:** “Chardi Virechanam Nasyam Swedo Dhooma Siravyadha Agnikarma Ksharayoga Pralepo Langanani Cha” (Bhaishajyaratnavali. Galaganda chikitsa.82) The therapies like Vamana, Virechana, Nasya, Swedana, Dhoomapana, Siravyadha, Ag-

nikarma, Kshara yogas, Pralepa, Langhana and Purana ghrita pana.

In Kaphaja Galaganda, Upanaha sweda is advised. The Chikitsa includes Nidana Parivarjana, Samshodana Chikitsa, Samshamana Chikitsa and Rasayana .

### Samshodana Chikitsa

- Snehapana- Amrutadya taila, Thumbi taila, Go ghrita
- Vamana- with madana phala pip-pali
- Mrudu Virechana- Gandharva hashtyadi taila or trivrut
- Nasya- Jeerna karkaru swarasa

### Yogas Kashya kalpana

- Varunadi kashyam

- Asanadi Kashayam
- Vatsakadi Kashayam
- Guggulutiktaka Kashyam

#### **Churna Kalpana**

- Shaddharana Churna
- Vyoshadi hurna
- Guggulu panchapalam Churna
- Abhaya Churna Churna

#### **Vati Kalpana**

- Kanchanara guggulu
- Triphala guggulu

#### **Arishta Kalpana**

- Amrta arishtam
- Abhayarishtam
- Ayaskriti

#### **Rasayana**

- Shilajatu
- Pippali
- Chitrakam

#### **Rasaoushadi**

- Mandura Bhasma
- Swarna Bhasma
- Abraka Bhasma

#### **Lepas**

- Nichuladi lepa
- Devadaru vishala lepa
- Hastikarna palasha lepa
- Sarshapadi pralepa

**Pathya Apathya:** The Pathya include Purana Ghrita pana, Jeerna Lohita shali, Yava, Mudga, Patola, Rakta shigru, Kathillaka, Salinca saka, Vetagra, Ruksha Katu Dravya, Deepana dravya and drugs like Guggulu and Shilajatu. The Apathya include Kshira Vikruti, Ikshu Vikruti, all types of mamsa, Anupa Mamsa, Pishtaanam, Madhura Amla Rasa and Guru Abhishyandakari Dravya.

**Yogasanas:** The Yogasanas like Halasanam, Paschimothanasanam, Matysaasanam, Sarvangasanam, Pavanamuktasanam, Suryanamaskaram,

Simhagarjanasanam and Kandarasanam are found beneficial. The breathing exercises like Pranayamam-Sheetali, Seethkara, Sadanda, Bastrika, Anuloma viloma pranayam and Ujjay swasa aids the healthy functioning of thyroid gland.

#### **Discussion**

Hypothyroidism is a burning issue, and the present treatment is not helping much in resolving the underlying pathology. The conceptual analysis of symptomatology of hypothyroidism helps us to identify it as Kapha Pradhana Tridosha Vyadhi with Rasa and Medo Dushti predominantly. The treatment can be planned based on Dosha Pratyaneeka Chikitsa than Vyadhi Pratyaneeka Chikitsa. The yogas like Varunadi Kashaya and Kanchanara guggulu helps in removing the Srotolepa and resolving Agnimandhya. The Sodhana Chikitsa helps in improving Agni and Sthanika Lepas helps in reducing Sthanika Dosha Vruddhi.

If the patient is already taking levothyroxine, the methodology to wean the patient off the drug needs further brain storming. If the patient is diabetic, hypertensive, the treatment plan should be with more caution.

#### **CONCLUSION**

Hypothyroidism can be considered as condition which results due to Agni Dushti.

Kapha Vata Dosha Vruddhi and Pitta Kshaya results due to Agnimandya. Dhatwagnimandya especially Rasa and Medho Dhatwagni Mandhya contributes to this condition. When approached hypothyroidism with Dosha Pratyaneeka Chikitsa, will help to manage the condition better. Use of Rasayanas will help to managing the condition as it helps in Srotomukha Sodhanam.



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