

**HYPOTHYROIDISM – AN AYURVEDA PERSPECTIVES**

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**ABSTRACT**

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>[1]</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.

**KEYWORDS:** According to World Health Organisation.

**INTRODUCTION**

2 billion people are iodine deficient worldwide.<sup>[2]</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.

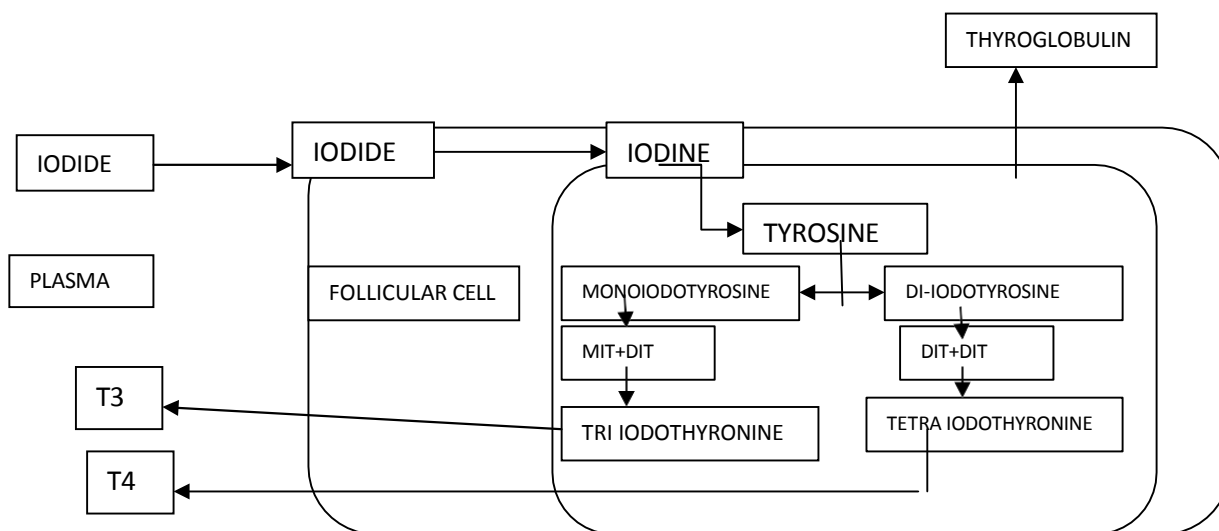
**Thyroid Gland Anatomy<sup>[3]</sup>**

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>[4]</sup>

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 Triiodothyronine T3 & Tetraiodothyronine (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 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>[5]</sup>

- Growth & development- for normal axonal & dendritic development myelination & 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 it 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 feedback 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 sends negative feedback to Anterior pituitary which in turn reduces the secretion of TSH.

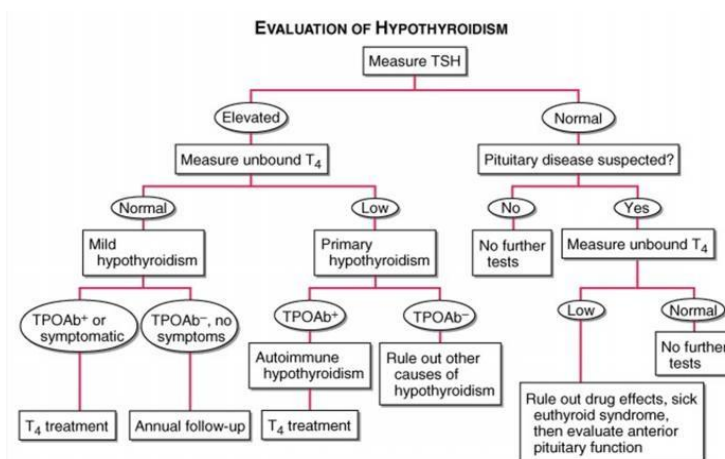
**Pathogenesis of Hashimoto's Thyroiditis<sup>[6]</sup>:** The Lymphocytic infiltration in thyroid follicles causes the germinal center formation. The atrophy of follicles results in oxyphil metaplasia. The absence of colloid matter and fibrosis happens which eventually leads to Atrophic thyroiditis.

**Pathogenesis of Autoimmune hypothyroidism<sup>[7]</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, Hairloss, 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 i.e. 1.6µg/Kg body weight (average 100-150µg). Levothyroxine is Synthetic T4 under brand names Levothyroid, Levoxyl, Synthroid, Tirosint, Unithroid, Thyronorm, Eltroxin, Cytomel, Thyrolar.

### 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	<i>Kapha vruddhi, Pitha kshaya</i>
2.	Puffiness of body features	<i>Kapha Vruddhi</i>
3.	Loss of appetite	<i>Kapha Vruddhi, Pitta Kshaya</i>
4.	Dry & coarse skin	<i>Vata Vruddhi, Pitta Kshaya</i>
5.	Minimal or absent sweating	<i>Pitta Kshaya</i>
6.	Anaemia	<i>Kapha-Vata Vruddhi, Pitta Kshaya</i>
7.	Constipation	<i>Vata Vruddhi</i>
8.	Hoarseness of Voice	<i>Kapha- Vata Vruddhi</i>
9.	Generalised Aches, Pain	<i>Vata Vruddhi</i>
10.	Muscular cramps, stiffness	<i>Vata Vruddhi</i>
11.	Sluggishness	<i>Kapha Vruddhi</i>

*Kapha- Utkrishta Vriddhi, Vata- Alpa/Madhyama Vriddhi, Pitha- Utkrishta Kshaya*

### Involvement of *Dhatu*

	Dhatu	Symptoms
1.	<i>Rasa</i>	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.	<i>Rakta</i>	Slow pulse rate, Dry skin, Slowing of mental activity, Lethargy
3.	<i>Mamsa</i>	Heaviness in the body, Muscle ache, granthi, Galaganda
4.	<i>Meda</i>	Tiredness, Sleepiness, sluggishness, Hyperlipidemia, Dyspnea on exertion
5.	<i>Asthi</i>	Osteoporosis, Osteoarthritis
6.	<i>Majja</i>	Osteoporosis
7.	<i>Shukra</i>	Loss of libido, infertility

**Involvement of Srotas**

	<b>Srotas</b>	<b>Symptoms</b>
1.	<i>Annavaha</i>	Loss of appetite, malabsorption
2.	<i>Rasavaha</i>	Weight gain, Loss of appetite, Heaviness of body, Lethargy, General-ised aches, Somnolence, premature aging symptoms like hair loss, Cold intolerance, Puffiness, Anaemia, Menstrual disturbances, Infertility
3.	<i>Raktavaha</i>	Slow pulse rate, Dry skin, Slowing of mental activity, Lethargy, Anaemia
4.	<i>Mamsavaha</i>	Oedema, <i>Galaganda</i>
5.	<i>Medovaha</i>	Tiredness, Sleepiness, Sluggishness, Hyperlipidemia, Dyspnea on exertion
6.	<i>Asthivaha</i>	Osteoporosis, Osteoarthritis, Hair loss
7.	<i>Majjavaha</i>	Osteoporosis
8.	<i>Shukravaha</i>	Loss of libido, Infertility
9.	<i>Purishavaha</i>	Constipation
10.	<i>Swedavaha</i>	Dry & coarse skin, absent/minimal sweating
11.	<i>Artavavaha</i>	Loss of libido, Infertility, Secondary amenorrhoea

**Involvement of Agni in Hypothyroidism**

*Dehagni* or *Jataragni* is the *raison d'être* 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. 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	<b>Ama</b> <b>Development of autoimmunity</b>
भूताग्नि	Iodine Selective trapping of iodide, transport, uptake by thyroid cells, organification
धात्वाग्नि	<i>Asthayi poshakamsha of dhatu</i> is vitiated. <i>Dhatwagni mandya</i>

*Kayagni* present in its own place, has portions of itself, present in the *Dhatus* also. Their decrease (in quantity, qualities or functions) and increase (in quantity, qualities or functions) give rise to increase and decrease of the *Dhatus* (respectively). If preceeding *Dhatu* is increased or decreased, it will increase or decrease the succeeding *Dhatu* too.

**Involvement of Ama:** *Annaroopa & mala sanchaya of ama* is present. 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 includes symptoms like lethargy, fatigue, heaviness in the body, sleepiness, loss of appetite.

### ***Samprapthi Ghataka***

- **Dosha-** Kapha vruddhi, pitta dushti, vata vruddhi
- **Dushya-** all dhatus predominantly rasa, meda
- **Agni-** Jatharagni, Dhatvagni
- **Ama-** Jatharagni mandya janita, Dhatvagnimandya janita
- **Srotas-** all srotas
- **Srotodushti-** Sanga, Vimarga gamana
- **Adhishtana-** gala pradesha
- **Udhabava sthana-** Amashaya Rogamarga- Bahya
- **Vyakta sthana-** Sharira

**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 Kapha- ja nanatmaja vikara and Acharya Vagbhata included it under Mukha roga.

### **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 Srotalepa 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 brainstorming. 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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