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 thyroidistis, Kapha dosha vruddhi, Vata dosha vruddhi, Pitta kshaya, Galaganda

**INTRODUCTION**

Hypothyroidism refers to any state that results in a deficiency of thyroid hormone, including hypothyroidism or pituitary disease and generalized tissue resistance to thyroid hormone and disorders that affect the thyroid gland directly\textsuperscript{1}. 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\textsuperscript{2}. The relative iodine deficiency causes Goiter and severe deficiency causes Hypothyroidism & Cretinism. On the other hand 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**\textsuperscript{3}

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
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. Idiodide 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**

- Growth & development - for normal axonal & dendritic development myelination & linear growth with maturational growth 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 – Hyposcretion of hormone causes excess sleep and hypersecretion causes sleeplessness.
• Action on sexual function – helps in normal sexual development & reproductive function.

HPT AXIS
Hypothalamo- Pituary- 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 send negative feedback to Anterior pituitary which in turn reduces the secretion of TSH.

Pathogenesis of Hashimoto’s Thyroiditisvii: 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 Hypothyroidismviii: 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 peroxidise 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 Serosus 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 i.e. 1.6µg/Kg body weight (average 100-150µg. Levothyroxine is Synthetic T4 under brand names Levothyroid, Levoxyl, Synthyroid, Tirosint, Unithroid, Thyro norm, Eltroxin, Cytomel, Thyrolar. The 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.

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

*Vruddhi* refers to an imbalance or increase, while *Kshaya* means decrease or deprivation.
11. Sluggishness  

**Kapha Vruddhi**

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

### Involvement of Dhatus

<table>
<thead>
<tr>
<th>Dhatu</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Rasa</td>
<td>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</td>
</tr>
<tr>
<td>2. Rakta</td>
<td>Slow pulse rate, Dry skin, Slowing of mental activity, Lethargy</td>
</tr>
<tr>
<td>3. Mamsa</td>
<td>Heaviness in the body, Muscle ache, granthi, Galaganda</td>
</tr>
<tr>
<td>4. Meda</td>
<td>Tiredness, Sleepiness, slughishness, Hyperlipidemia, Dyspnnea on exertion</td>
</tr>
<tr>
<td>5. Asthi</td>
<td>Osteoporosis, Osteoarthritis</td>
</tr>
<tr>
<td>6. Majja</td>
<td>Osteoporosis</td>
</tr>
<tr>
<td>7. Shukra</td>
<td>Loss of libido, infertility</td>
</tr>
</tbody>
</table>

### Involvement of Srotas

<table>
<thead>
<tr>
<th>Srotas</th>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Annavaha</td>
<td>Loss of appetite, malabsorption</td>
</tr>
<tr>
<td>2. Rasavaha</td>
<td>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</td>
</tr>
<tr>
<td>3. Raktavaha</td>
<td>Slow pulse rate, Dry skin, Slowing of mental activity, Lethargy, Anaemia</td>
</tr>
<tr>
<td>4. Mamsavaha</td>
<td>Oedema, Galaganda</td>
</tr>
<tr>
<td>5. Medovaha</td>
<td>Tiredness, Sleepiness, Sluggishness, Hyperlipidemia, Dyspnnea on exertion</td>
</tr>
<tr>
<td>6. Asthivaha</td>
<td>Osteoporosis, Osteoarthritis, Hair loss</td>
</tr>
<tr>
<td>7. Majjavaha</td>
<td>Osteoporosis</td>
</tr>
<tr>
<td>8. Shukravaha</td>
<td>Loss of libido, Infertility</td>
</tr>
<tr>
<td>9. Purishavaha</td>
<td>Constipation</td>
</tr>
<tr>
<td>10. Swedavaha</td>
<td>Dry &amp; coarse skin, absent/minimal sweating</td>
</tr>
</tbody>
</table>
Involvement of Agni in Hypothyroidism

आयुर्वेणों बल्व स्वास्थ्य उत्साहो उपचारो प्रभा.
ओजोन्तो अग्निः प्राणशीलकित्
देहागमेन्दुकः। (च.चि.१५/३)

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.

Involvement of Ama: Annaroopa & mala sanchaya of ama is present सोतीरोधबलशारीरिक विकारमूदलता:।
अत्सापकित्वमेंयुनसागरुचिंकलम्। (अ.ह.सू. ११/३४)

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.

Samprapthi Ghataka

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
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**Dosha:** Kapha vruddhi, pitta dushti, vata vruddhi

**Dushya:** all dhatu predominantly rasa, medha

Agni- Jatharagni, Dhatvagni

Ama- Jatharagni mandya janita, Dhatvagnimandya janita

**Samprapthi**

<table>
<thead>
<tr>
<th>Aharaja</th>
<th>Viharaja</th>
<th>Manasika</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kapha Vaishamaya</td>
<td>Pitta Vaishamaya</td>
<td>Vata Vaishamaya</td>
</tr>
</tbody>
</table>

**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-nanatmaja vikara and Acharya Vagbhata 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, Agnikarma, Kshara yogas, Pralepa, Langhana and Purana ghrita pana.

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

**Samshodana Chikitsa**
- Snehapanha- Amrutadya taila, Thumbi taila, Go ghrita
- Vamana- with madana phala pippali
- Mrudu Virechana- Gandharva hastyadi taila or trivrutt
- Nasya- Jeerna karkaru swaras

**Yogas Kashya kalpana**
- Varunadi kashyam
Aswathy Prakash C & Byresh A.: Understanding Hypothyroidism In Ayurveda

- 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, Ruksa 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, Matysaaanam, Sarvangasanam, Pavamamuktasnam, 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 Srotoplepa 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 stroming. 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 Chiktsa, 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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Source of support: Nil
Conflict of interest: None Declared