LOCATION AND APPLIED PHYSIOLOGY OF THYROID GLAND- AN
AYURVEDIC PERSPECTIVE
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ABSTRACT
Thyroid is one of the largest endocrine gland. It regulates the metabolic rate of our body. In Ayurveda mainly it is related to concept of “Agni” or metabolic fire which is responsible for all activity including cellular metabolism also. Now a days there is marked increase in disorders related to thyroid dysfunction so for effective Ayurvedic management & study the causes of thyroid disorders we need proper understanding of physiology of thyroid hormone as per the principles of Ayurveda. As per an Ayurvedic perspective on location of thyroid gland, Overall idea about applied physiology of thyroid gland and its correlation with the Doshas and strotasas which are involved; as well as a role of Agni and Pitta with the physiology of thyroid gland.

Keywords - Thyroid gland, Ayurveda, Dosha, Strotasa, Agni, Pitta.

INTRODUCTION
As mentioned in Ayurveda agni, tridosh, Dhatu & mala functions consequently so there is samavastha of human body. If one of them get disturbed, there will be dis-eased condition in our body.¹All these factors also control the thyroid gland. So disturbance in these bio humour can cause disorders of thyroid hormones. In Ayurveda, anatomical explanation is not available clearly but we can predict functions of thyroid gland physiologically. So we have to revise the study of Endocrinology as an Ayurvedic perspective. Out of this Thyroid gland is one of the large endocrine gland in our body, which regulates the metabolic rate of our body. Its location is in neck region. In Ayurveda, the Kantha (neck region) is the sthana of Kaphadosha, Prana and Udana Vayu, Mamsa and Medadhatu which are related with thyroid gland. Here we are going to revise applied physiology of thyroid gland with respect to its functions i.e. hypo secretions & hyper secretions and also of Agni which is responsible for metabolic rate. Agni gives strength and nourishment to Pitta.

Materials &Methods-
This study is mainly literary review from Ayurvedic texts Bruhtrayi and Laghutrayi and its commentators. Also modern aspect of Applied physiology i.e. hyperthyroidism and hypothyroidism is reviewed from modern texts and by searching various
medical research databases like Google scholar, research articles published in various Ayurvedic journals and national research databases etc. Study is mainly conceptual based.

**Location of Thyroid Gland** - Thyroid gland is situated in the anterior part of neck (Kantha). Doshas are present in each and every cell of human being and some structures are considered as special seats of Doshas so following features of tridosha can be correlated with functions of thyroid.

1. **Kapha Dosha** – According to AshtangHrudaya, Kantha is considered as one among the kaphasthana.

2. **Prana Vayu** – According to Charak and Vagbhata, PranaVayu is located in Kantha.

3. **Udana Vayu** – According to Vagbhata, UdanaVayu is located in Galapradesh/Kantha.

4. **Chakrapani in Charak SharirSthana** said, The structures present in neck are two in number and mainly of kaphaj, so location of the thyroid gland in the neck (hard structures are on both side of throat) can be considered.

5. **Dhatu** – This gland is also related with Mamsa and Medadhatu.

   a) **Mamsa Dhatu** – As stated by Sushruta Twacha is updhatu of mamsadhata i.e. Rohinitwak which is 6th layer has a diseases like galgand rogadhishthana. So it can be a seat of thyroid gland dysfunction.

   b) **Meda Dhatu** – This gland is also related with Medadhatu.

**Applied Physiology of Thyroid Hormone** - Each disease of thyroid gland is caused due to disturbances of Tridosha in which especially Pitta, & agni. Diseases of thyroid gland generally not explained by ayurvedic texts but sign & symptoms of some diseases e.g. galagand, arbuda can be correlated with disorders of thyroid.

In hyperthyroidism and hypothyroidism there are many signs and symptoms which are related to many systemic dysfunctions so it is very difficult to correlate these two entities with any of the disease mentioned in Ayurveda. So there is involvement of Tridosha and Strotasa in forming diseases. So we can treat the thyroid disorders by knowing the applied physiology of thyroid hormone with the condition of dosha, strotasas and Agni and their interrelation.

| Table No.1 Correlation of features of Hyperthyroidism with Doshas and Strotasas– |
|---------------------------------|-----------------|-----------------|
| **System** | **Hyperthyroidism** | **Dosha** | **Strotasa** |
| G.I.T. Symptoms | a)Diarrhoea | Pitta | Annavaha |
| | b)Anorexia | | AnnavahadRasavaha |
| | c)Vomiting | | AnnavahadRasavaha |
| | d)Wt loss | | AnnavahaRasavaha |
| Cardio respiratory Symptoms | a)Palpitations | Vata | Rasavaha, Rasavaha |
| | b)Tachycardia | | Rasavaha, Rasavaha |
| | c)Cardiac failure | | Rasavaha, Rasavaha |
| | d)Dyspnoea on exertion | | Rasavaha, Rasavaha |
| Neuromuscular Symptoms | a)Nervousness, Irritability, Emotional liability | Vata | Manovaha |
| | b)Muscle Weakness | | Asthivaha |
| Dermatological Symptoms | a)Increased sweating | Pitta | Swedavaha |
| | b)Pigmentation | | Raktabhaha |
| | c)Erythematic | | Raktabhaha |
| Reproductive | a)Amenorrhoea | Vata, | Artavavaha and |

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1. **GIT Symptoms** – These are due to the *vrudhi* of *pitta* so secretions from *Amashaya* is increased leading to improper digestion of food so decreased activity of *dhatwagni* causing all *dhatukshaya* and thus gives symptoms like diarrhoea anorexia, vomiting which further causes wt loss.

2. **Cardio respiratory** – These are due to *Prana vayu* and *Rasavaha* strotasa *dushti*. The function of *Prana vayu* is in hyperthyroidism all the functions *prana* is getting highly activated and also the location of *rasavaha* strotas is *Hridaya*.

3. **Neuromuscular Symptoms** – These are due to *vata* and *asthivaha* strotasa *dushti*. Due to excess *vata* arises and speeds up all the process causing nervousness, irritability and muscle weakness is due to *Asthivaha Strotdushti*.

4. **Dermatological Symptoms** – These are formed due to *pitta*. *Bhrajaka Pitta* which is located in *twak* increased thus due to increased *Tikshn* and *Ushna* properties of *Pitta* and also *Raktavaha* and *swedavaha* strotasas *dushti* gives symptoms like increased sweating, pigmentation, erythema etc.

5. **Reproductive symptoms** – These are due to in excess *Vata*, *Pitta* and *Artavavaha* and *Shukravaha* stroto *dushti*.

6. **Ocular Symptoms** – Exophthalmos i.e. protrusion of eyeball is due to *Pitta* in which *Drava guna* of *pitta* increased an gives oedematous swelling of tissue and changes in extra ocular muscle causing protrusion of eyeball.

7. **General** –

   **Heat intolerance** – *Ushna Guna of Pitta* increased causing burning sensation and irritation of body.

   **Thirst** – *Ushna* and *Tikshna Guna of Pitta* increased and gives desire of more water drinking.

### Correlation of Features of Hypothyroidism with Dosha and Strotasas involved-

<table>
<thead>
<tr>
<th>System</th>
<th>Hypothyroidism</th>
<th>Dosha</th>
<th>Strotasa</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>G.I.T. Symptoms</strong></td>
<td>a)Wt gain</td>
<td>Kapha</td>
<td>Annavaha &amp;Rasavaha</td>
</tr>
<tr>
<td></td>
<td>b)Constipation</td>
<td>Pitta</td>
<td><em>Purishvaha</em></td>
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<td></td>
<td>c)Anaemia</td>
<td>Pitta</td>
<td><em>Rasavaha</em></td>
</tr>
<tr>
<td><strong>Cardio respiratory</strong></td>
<td>a)Bradycardia</td>
<td>Vata</td>
<td><em>Rasavaha</em></td>
</tr>
<tr>
<td>Symptoms</td>
<td>b)Hypertension</td>
<td>Vata</td>
<td><em>Rasavaha</em></td>
</tr>
<tr>
<td></td>
<td>c)Pericardial and Pleural effusion</td>
<td>Kapha</td>
<td><em>Rasavaha</em></td>
</tr>
<tr>
<td><strong>Neuromuscular Symptoms</strong></td>
<td>a)Muscle pain Joint pain</td>
<td>Vata</td>
<td><em>Asthivaha, Majjavaha</em></td>
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<tr>
<td></td>
<td>b)Weakness in extremities</td>
<td>Vata</td>
<td></td>
</tr>
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<td></td>
<td>c)Depression Impaired memory</td>
<td>Vata</td>
<td></td>
</tr>
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<td></td>
<td>Forget fullness Inability to concentrate</td>
<td>Vata</td>
<td></td>
</tr>
<tr>
<td><strong>Dermatological</strong></td>
<td>a) Dry skin</td>
<td>Vata, Kapha</td>
<td><em>Rasavaha</em></td>
</tr>
</tbody>
</table>
b) Hair loss, dry hair Loss of scalp hair, axillary hair, pubic hair Myxoedema

Vata, Kapha

Asthivaha

Kapha

Reproductive Symptoms

a) Menorrhagia
b) Impotence
c) Infertility

Vata, Pitta

Artavavaha

Shukravaha

Ocular Symptoms

Blurred vision

Pitta

Rasavaha

E.N.T. Symptoms

a) Decreased hearing
b) Fullness in throat
c) Hoarseness

Vata

Kapha

Vata

Asthivaha

Pranavaha

Pranavaha

General Symptoms

a) Cold intolerance
b) Sleepiness
c) Loss of energy

Kapha

Kapha

Vata

Rasavaha

Rasavaha

Rasavaha

1. G.I.T. Symptoms –

Weight Gain – Due to Kaphavruddhi and Rasavaha and Annavaha Strotorodh causing heaviness in body

Constipation – Anaemia may be due to improper digestion of pachak pitta causing Agnimandya. So causing improper sara -kittavibhajana. Also Ranjana karma of Ranjak Pitta gets decreased causing anaemia.

2. Cardio respiratory – Decreased activities of vata and Rasavaha strotosa gives symptoms like bradycardia, Hypertension, Pleural and pericardial effusion & it is due to increased dravaguna of kapha.

3. Neuromuscular Symptoms – These are due to vatakshaya and Asthivaha and MajjavahaStrotodushti effects on Mana, Buddhi, Asthi and Snayu.

4. Dermatological Symptoms – Due to decreased Ruksha Guna of vata, causes of Rukshan of Rasa dhatu. Also snigdha property of Kapha decreased so snehan is not occurred properly; giving dryness all over the body. None pitting oedema – Due to Kapha and Pitta dushti also Raktavaha strotodushti

5. Reproductive – Due to decreased vata, pitta and also Artavavaha and Shukravaha strotodushti.

6. Ocular – Due to formation of anaemia, main symptom akshikutashoth which causes decreased vision capacity giving blurred vision.

7. E.N.T –

A) Decreased hearing due to increased Vata causes Asthikshaya.

B) Fullness in throat – due to kapha and pranvaha strotodushti.

C) Hoarseness – is due to vata vrudhi in which Ruksha property of vata get increased so shoshan of snigdha & dravaguna is increased giving hoarseness.

8. General –

a) Sheetguna of kapha increased causing sheetdwesh.

b) Loss of energy is due to vatakshaya which does not give inspiration to do work.

Importance of Agni and Pitta in Thyroid Hormone – Charaka States that agni is responsible for lifespan, complexion, power/strength, health, enthusiasm, lustre, immunity, energy, heat processes and prana. If the karma of Agni is stopped, individual goes to die. All lives lifelong free
from disease if it functions properly and suffers illness it becomes deranged. Also according to vaghhbata\textsuperscript{15} All diseases are formed due to agnivikriti. Charak described thirteen individual agni categorized into three types – 1) Digestive fire - 1 2) fire of five elements – 5 3) fire of seven tissue elements – 7

**Discussion:** The correlation Types of pitta with thyroid dysfunction.

<table>
<thead>
<tr>
<th>Sr no.</th>
<th>Type of Pitta</th>
<th>Hyperthyroidism</th>
<th>Hypothyroidism</th>
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<tbody>
<tr>
<td>A)</td>
<td>Pachak Pitta</td>
<td>1) Increased appetite</td>
<td>1) Constipation</td>
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<td></td>
<td></td>
<td>2) Increased defecation</td>
<td>2) Ascites</td>
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<td></td>
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<td>Diarrhoea</td>
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<td>4) Vomiting</td>
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<td>B)</td>
<td>Sadhak Pitta</td>
<td>Nervousness</td>
<td>1) Depression</td>
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<td></td>
<td></td>
<td>Irritability</td>
<td>2) Forgetfulness</td>
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<td></td>
<td></td>
<td>3) Emotional liability</td>
<td>3) Impaired Memory</td>
</tr>
<tr>
<td>C)</td>
<td>Alochak Pitta</td>
<td>Exophthalmos</td>
<td>Blurred Vision</td>
</tr>
<tr>
<td>D)</td>
<td>Bhrajkita Pitta</td>
<td>1) Increased Sweating</td>
<td>1) Dry Skin</td>
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<td></td>
<td></td>
<td>2) Pigmentation</td>
<td>2) Scaliness of skin</td>
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<tr>
<td></td>
<td></td>
<td>3) Erythema</td>
<td></td>
</tr>
<tr>
<td>E)</td>
<td>Ranjak Pitta</td>
<td>Intolerance to heat</td>
<td>Anaemia</td>
</tr>
</tbody>
</table>

After observing above symptoms, it is clear that Pachak Pitta, Sadhak Pitta and Bhrajkita Pitta are severely affected. Although the applied physiology of thyroid hormone i.e. hyperthyroidism and hypothyroidism is not described in classical Ayurvedic texts. So we can correlate the features with doshas especially Pitta, strotasas and with Agni. This can be understood as follows -

**Dosha**- Vata, Pitta, Kapha

**Strotasas** - Annavaha, Rasavaha, Pranavaha, Asthivaha, Swedavaha, Rackavaha, Artavavaha, Shukravaha, Udakavaha, Majjavaha and Manovaha If we correlate all these features with the types of Pitta during the treatment of thyroid disorders, the dosha especially Pitta, strotasas and agni has to be targeted with special attention to strength of body, mind and dosha.

**Summary:** Thyroid disorders are hormonal disorders comprising of groups of symptoms involving different systems of body. There are no direct references available about anatomy and physiology of thyroid gland in ayurvedic texts. Hence there is an intense need to clarify the subject with Ayurvedic perspective. So the same has been done successfully by comparing the features of applied physiology of thyroid hormone mentioned in modern medical books to that of Ayurveda terminology.
CONCLUSION
Ayurveda always states that if you don’t find the name of particular disease in text, in such situation correlate the features of applied physiology with doshas and strotasas which are involved and then only treat as per Ayurvedic principles of treatment. So from this review it can be concluded that Ayurvedic system can also provide a relief to the patients if we do treatment according to the targeted dosha, strotasas and agni then patients can take benefits of Ayurvedic medicines for healthful longevity. For this applied physiology will be helpful.

REFERENCES
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