

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 diseased condition in our body.¹All these factors also control the thyroid gland. So disturbance in these bio humours 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 re-

gion. 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 Dosh*² – According to Ash-tangHrudaya, *Kantha* is considered as one among the *kaphasthana*.

2) *Prana Vayu*³ – According to *Charak* and *Vagbhata*, *PranaVayu* is located in *Kantha*.

3) *Udana Vayu*⁴ – According to *Vagbhata*, *UdanaVayu* is located in *Galapradesh / Kantha*.

4) *Chakrapani* in *Charak SharirSthana* said⁵, 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 *Medadhātu*.

a) *Mamsa Dhatu*⁶ – As stated by *Sushruta Twacha* is *updhātu* of *mamsadhātu* i.e. *Rohinitwak* which is 6 th layer has a dis-eases like *galgand rogadhishtana*. So it can be a seat of thyroid gland dysfunction.

b) *Meda Dhatu*⁷ – This gland is also re-lated with *Medadhātu*.

Applied Physiology of Thyroid Hor-mone-

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.⁸

Table No.1 Correlation of features of Hyperthyroidism with Doshas and Strotasas–

System	Hyperthyroidism	Dosha	Strotasa
G.I.T. Symptoms	a)Diarrhoea b)Anorexia c)Vomiting d)Wt loss	<i>Pitta</i>	<i>Annavaha</i> <i>Annavaha&Rasavaha</i> <i>Annavaha&Rasavaha</i> <i>Annavaha&Rasavaha</i>
Cardio respiratory Symptoms	a)Palpitations b)Tachycardia c)Cardiac failure d)Dyspnoea on exertion	<i>Vata</i>	<i>Rasavaha, Rasavaha</i> <i>Rasavaha, Rasavaha</i>
Neuromuscular	a)Nervousness, Irritability, Emo-tional liability b)Muscle Weakness	<i>Vata</i>	<i>Manovaha</i> <i>Asthivaha</i>
Dermatological Symptoms	a)Increased sweating b)Pigmentation c)Erythematic	<i>Pitta</i>	<i>Swedavaha</i> <i>Raktavaha</i> <i>Raktavaha</i>
Reproductive	a)Amenorrhoea	<i>Vata,</i>	<i>Artavavaha and</i>

Symptoms	b) Spontaneous abortion c) Infertility	<i>Pitta</i>	<i>Shukravaha</i>
Ocular Symptoms	Exophthalmoses	<i>Pitta</i>	
General Symptoms	a) Heat intolerance b) Fatigue c) Thirst	<i>Pitta</i> <i>Vata</i> <i>Pitta</i>	<i>Rasavaha</i> <i>Udakavaha</i>

- GIT Symptoms** – These are due to the *vrudhhi* 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.
- Cardio respiratory⁹** – These are due to *Prana vayu* and *Rasavaha strotasa dushti*. The function of *Prana vayu* is in hyperthyroidism all the functions i.e. *हृदयक* is getting highly activated and also the location of *rasavaha strotas* is *Hridaya*.
- Neuromuscular Symptoms** – These are due to *vata* and *asthivaha strotodushti*. Due to excess *vata* arises and speeds up all the process causing nervousness, irritability and muscle weakness is due to *Asthivaha Strotodushti*.
- 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.

- Reproductive symptoms¹⁰** – These are due to in excess *Vata*, *Pitta* and *Artavavaha* and *Shukravaha strotodushti*
- Ocular Symptoms** – Exophthalmos i.e. protrusion of eyeball is due to *Pitta* in which *Drava guna* of *pitta* increased and gives oedematous swelling of tissue and changes in extra ocular muscle causing protrusion of eyeball.
- 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 No.2

System	Hypothyroidism	Dosha	Strotasa
G.I.T. Symptoms	a) Wt gain b) Constipation c) Anaemia	<i>Kapha</i> <i>Pitta</i> <i>Pitta</i>	<i>Annavaha & Rasavaha</i> <i>Purishvaha</i> <i>Rasavaha</i>
Cardio respiratory Symptoms	a) Bradycardia b) Hypertension c) Pericardial and Pleural effusion	<i>Vata</i> <i>Vata</i> <i>Kapha</i>	<i>Rasavaha</i> <i>Rasavaha</i>
Neuromuscular Symptoms	a) Muscle pain Joint pain b) Weakness in extremities c) Depression Impaired memory Forgetfulness Inability to concentrate	<i>Vata</i> <i>Vata</i>	<i>Asthivaha,</i> <i>Majjavaha</i>
Dermatological	a) Dry skin	<i>Vata, Kapha</i>	<i>Rasavaha</i>

Symptoms	b) Hair loss, dry hair Loss of scalp hair, axillary hair, pubic hair Myxoedema	Vata, Kapha Kapha	Asthivaha
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 *Kaphavrudhi* 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**¹¹ These are due to *vatakshaya* and *Asthivaha* and *Majjavaha Strotodushti* effects on *Mana, Buddhi, Asthi and Snayu*.

4. **Dermatological Symptoms** – Due to decreased *Ruksha Guna* of *vata*, causes of *Rukshan* of *Rasa dhatu*. Also *snigdhta* 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**¹² – 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 work¹³.

Importance of Agni and Pitta in Thyroid Hormone¹⁴ – *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 *vagbhata*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 No. 3-

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

After observing above symptoms, it is clear that *Pachak Pitta*, *Sadhak Pitta* and *Bhrajak 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*, *strotasa* and with *Agni*. This can be understood as follows-

Dosha- *Vata*, *Pitta*, *Kapha*

Strotasas - *Annava*, *Rasava*, *Pranava*, *Asthivaha*, *Swedavaha*, *Raktavaha*,

Artavavaha, *Shukravaha*, *Udakavaha*, *Majjavaha* and *Manovaha* If we correlate all these features with the types of *Pitta*

Of these 13 types of *agnis*, *Jatharagni* is most important and master of all *agnis*. This *agni* gives strength and nourishment to *pitta*.¹⁶ Also *Pitta* is formed by *panch-mahabhuta* in which high proportion of *Agni mahabhuta* is present. Function of *Pitta*¹⁷ is the same as *Agni* function. So *Pitta* and *Agni* is responsible for all metabolic actions carried out by thyroid gland.

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

1. Maharshi Sushruta, Sushruta Samhita, Sutrasthana, Volume, 15/47, Edited by Anantram Sharma, ChaukhambaSurbharatiPrakashan, Varanasi, Edition 2010, 130.
2. Vagbhata, Ashtanghrudayam, Sutrasthana, Doshabhediya Adhyaya, 12/3, Edited by KavirajAtridevGupta, VaidyaYadunandanUpadhyaya, ChaukhambaPrakashan, Edition 2011, 120.
3. Agnivesha, Charak, Drudhabala, CharakSamhita, Chikitsasthana, VatavyadhiChikitsa Adhyaya, 28/6, Edited by VaidyaJadhavjiTrikamjiAcharya, ChaukhambasankritaSansthan, Edition 2013, 687
4. Vagbhata, Ashtanghrudayam, Sutrasthana, Doshabhediya Adhyaya, 12/5, Edited by KavirajAtridevGupta, VaidyaYadunandanUpadhyaya, ChaukhambaPrakashan, Edition 2011, 120.
5. Agnivesha, Charak, Drudhabala, CharakSamhitaSharirasthana, SharirSankhyaSharir Adhyaya, 7/11, Edited by VaidyaJadhavjiTrikamjiAcharya, ChaukhambasankritaSansthan, Edition 2013, 338.
6. Maharshi Sushruta, Sushruta Samhita, Sharirasthana, Volume 2, Garbhavyakaran Sharir Adhyaya, 4/4, Edited by Anantram Sharma, ChaukhambaSurbharatiPrakashan, Varanasi, Edition 2010, 47.
7. Vagbhata, Ashtanghrudayam, Sutrasthana, Doshadividnyaniya Adhyaya, 11/10, Edited by KavirajAtridevGupta, VaidyaYadunandanUpadhyaya, ChaukhambaPrakashan, Edition 2011, 115.
8. Agnivesha, Charak, Drudhabala, CharakSamhitaSutrasthana, Trishothiya Adhyaya, 18/44, Edited by VaidyaJadhavjiTrikamjiAcharya, ChaukhambasankritaSansthan, Edition 2013,
9. Vagbhata, Ashtanghrudayam, Sutrasthana, Doshabhediya Adhyaya, 12/4-5, Edited by KavirajAtridevGupta, VaidyaYadunandanUpadhyaya, ChaukhambaPrakashan, Edition 2011, 120.
10. Maharshi Sushruta, Sushruta Samhita, Sharirasthana, Volume 2, Dhamanivakaran Sharir Adhyaya, 9/12, Edited by Anantram Sharma, ChaukhambaSurbharatiPrakashan, Varanasi, Edition 2010, 122.
11. Vagbhata, Ashtanghrudayam, Sutrasthana, Doshadividnyaniya Adhyaya, 11/15, Edited by KavirajAtridevGupta, VaidyaYadunandanUpadhyaya, ChaukhambaPrakashan, Edition 2011, 116.
12. Agnivesha, Charak, Drudhabala, CharakSamhitaChikitsasthana, Pan-

- duchikitsa Adhyaya, 16/15, Edited by Vaidya Jadhavji Trikamji Acharya, Chaukhambasankrita Sansthan, Edition 2013,.....
13. Vagbhata, Ashtanghrudayam, Sutrashtana, Doshadividnyaniya Adhyaya, 11/15, Edited by Kaviraj Atridev Gupta, Vaidya Yadunandan Upadhyaya, Chaukhamba Prakashan, Edition 2011, 116.
14. Agnivesha, Charak, Drudhabala, Charak Samhita Chikitsasthana, Granichikitsa Adhyaya, 15/3-4, Edited by Vaidya Jadhavji Trikamji Acharya, Chaukhambasankrita Sansthan, Edition 2013, 358.
15. Vagbhata, Ashtanghrudayam, Nidanasthana, Udarnidan Adhyaya, 12/1, Edited by Kaviraj Atridev Gupta, Vaidya Yadunandan Upadhyaya, Chaukhamba Prakashan, Edition 2011, 358.
16. Maharshi Sushruta, Sushruta Samhita, Sutrashtana, Volume 1, Rasavisheshvidnyaniya Adhyaya, 42/5, Edited by Anantram Sharma, Chaukhamba Surbharati Prakashan, Varanasi, Edition 2010, 327.
17. Vagbhata, Ashtanghrudayam, Sutrashtana, Doshadividnyaniya Adhyaya, 11/2-3, Edited by Kaviraj Atridev Gupta, Vaidya Yadunandan Upadhyaya, Chaukhamba Prakashan, Edition 2011, 114.
18. Ayurvediya Kriya Sharir, Dr. Ranjit Rai Desai, Baidyanath Ayurveda Bhavan, 1st Edition, 2003, Page no. 332
19. Ayurvediya Kriya Sharir, Dr. Ranjit Rai Desai, Baidyanath Ayurveda Bhavan, 1st Edition, 2003, Page no. 446
20. Sarira Kriya Vidnana, Dr. Nandini D. Dhargaalkar, Chaukhamba Prakashan, 2nd Edition, 2010, Page no. 823.
21. Principles of Anatomy and Physiology, Jerard J. Tortora Bryan Derrikson, 13th Edition, Volume 1, Page no. 696.
22. A Textbook of Medical Physiology, Arthur Gyton and John Hall, Elsevier Saunders 2006, 11th Edition, Page no. 931.
23. Essential of Medical Physiology, K. Sembulingam, Jaypee Brothers Medical Publishers, 4th Edition 2006, Page no. 358.

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