



ROLE OF AGNI IN HYPOTHYROIDISM

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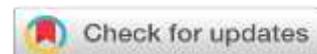
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ABSTRACT

Hypothyroidism is a metabolic disorder causing hormonal disturbances according to Morden science. It can be correlated to *Dhatvagni Mandya* in *Ayurveda*. Due to the different causative factors, *Jataragni Mandya* happens which leads to *Ama* formation and subsequent *Dhatvagni Mandya*. Currently, in modern science, hormonal replacement therapy is the only option available which is causing serious side effects and lifelong hormonal dependency. Sincerity is a lifestyle metabolic disorder; it can be managed by *Ayurveda* by correcting lifestyle along with *panchakarma* to do the *Shareera Sodhan* and to improve the *Agni* with *Deepan* and *Pachan* medicines. This paper tries to explore the treatment options available in *Ayurveda* for hypothyroidism.

Keywords: Hypothyroidism, Jatharagni, Mitochondria, TRs.

INTRODUCTION

Hypothyroidism is a metabolic disorder caused by a disturbance in metabolism causing hormonal disturb-

ances which in turn further slows down the metabolism according to Modern science. (A metabolic disorder is - a waistline of 40-inches and 35-inches for

women and men respectively, triglyceride level more than 150 mg/dl, blood pressure 130/85 mmHg or greater, HDL cholesterol less than 40 mg /dl, and other criteria are micro albuminuria. Patients with any three out of five come under the umbrella of metabolic disorder). The central feature of Hypothyroidism is decreased production of the hormone. Primary hypothyroidism may be caused by any pathology in the thyroid gland. 99% of cases are accounted by primary hypothyroidism rest with 1% being due to central or secondary hypothyroidism i.e. TSH deficiency. (1) Thyroid gland secretes three hormones - Thyroxin (T4), Triiodothyronine (T3), and calcitonin. The term thyroid hormone is restricted to Thyroxin and triiodothyronine and these two have the same biological activity. The inter follicular cells produce calcitonin which regulates calcium metabolism. In *Ayurveda*, there is no terminology for hormones and glands so there is no direct correlation between hypothyroidism and hyperthyroidism. The main action of thyroid hormone is on metabolism so it can be correlated with the action of *Agni*. Term *Agni* is used for the digestive fire which plays a most important role in the digestion of food and the formation of metabolic products. There are main three types of *Agni* explained by *Acharyas* in *Ayurveda Jathragani*, *Bhutagni*, and *Dhatuagni* which plays important role in digestion. *Jathragani Pakka* first stage of digestion second stage is *Bhutagni Pakka*, the last stage is *Dhatuagni Pakka* which results in the formation of *Saptadhatu*. After reviewing different texts, it can be concluded that in Hypothyroidism, *Dhatuagni* mandya is the leading culprit.

AIM AND OBJECTIVE

1. To review the available literature in *Ayurvedic* text and correlation with modern literature on Hypothyroidism
2. To review *Dhatvagni mandya* and *Dhatu pradoshaja vikar* in the context of Hypothyroidism.
3. To review the management of Hypothyroidism.

MATERIAL AND METHODS- *Dhatvagni* has been explained by *Charaka* in *Grahani roga chikitsa* and *Dhatu pradoshaja vikar* has been explained in *Charak sutra 29th Adhyaya*.

AGNI

Term *Agni* is used for the digestive fire which plays a most important role in the digestion of food and the formation of metabolic products. According to *Charaka Samhita* (1), *Agni* is nothing but the *Pitta* in the body that produces wholesome or unwholesome effects in vitiated and unvitiated states respectively. It is responsible for digestion-indigestion, Vision-non vision, proper degree of temperature otherwise heat, normal-abnormal complexion, power-fear, anger- exhilaration, confusion and clarity, and other such duals.

Importance of DEHA-AGNI (2)

आयुर्वर्णो बलं स्वास्थ्यमुत्साहोपचयौ प्रभा| ओजस्तेजोऽनयः प्राणाश्चोक्ता
देहाग्निहेतुकाः||३|

Dehagni is responsible for longevity, glowing healthy skin, good body strength and health, excitement in life, well growth, good radiancy, great *ojas*, normal body temperature, and managing various other forms of *Agni*. Even the very existence of a person is said to be of *Dehagni*.

शान्तेऽग्नी प्रियते, युक्ते चिरं जीवत्यनामयः| रोगी स्याद्विकृते,
मूलमग्निस्तस्मान्निरुच्यते||४||

When the *Agni* in the body subsides, it causes death and when it functions normally it provides health and longevity to the body. If the *Agni* is vitiated, then the person may suffer from various ailments therefore the *Agni* is said to be the foundation of a long health living. Body tissues are nourished by the food which promotes *ojas*, strength, radiance, etc only when the *Agni* is present. When there is improper or poor digestion, normal body tissues like *rasa* can neither be formed nor nourished.

Different phase of digestion

- The process of digestion of food has three stages. They are *Jataragni paka*, *Bhoota Agni* and *Dhatvagni paka*. In *Jataragni Paka*, the consumed food having all six *rasas* undergoes 3 stages of digestion.
- The first stage of *Jataragni Pakka Madhur avasta paaka* results in the formation of *Phenabhoot kapha*.

- The second stage of *Jathragani Pakka Amla avasta paaka* results in the formation of *Achaa pitta*.
- The third stage is *Jathragani Pakka katu Avasta paaka* which results in the formation of *Vata*.

BHOOTAGNI AVASTAPAKKA (3)

भौमाप्याग्नेयवायव्याः पञ्चोष्माणः सनाभसाः |
पञ्चाहारगुणान्स्वान्स्वान्पार्थिवान्वादीन्यचन्ति हि॥१३॥

Bhoota Agni are of five types - *Parthiva, Apya, agneya, vayavya and nabhasa*.

Contents of the food is metabolised by each *mahabhutas* which are resemble to their respective compositions.

DHATWAGNI AVASTAPAKKA (4)

Seven constituents that maintain the body, called *dhatu* (tissues), are transformed into *Sara Bhaga* (nutrition) and *kitta bhaga* (waste). Each *Dhatvagni* is specific for its corresponding *Dhatu*.

(The sequence of *dhatu* formation is *Rasa, Rakta mamsa, meda, asthi, majja, sukra*).

Four types of *Agni* are described in *Ayurveda* by *Acharya charaka* (5)

Samaagni

Sama means (without any irregularity) so the *Agni* which does proper digestion of food without any irregularity. It is due to all *Dosa (Vata, Pitta, Kapha)* equilibrium states.

Vishamagani (Vata predominance) – *Agni* responsible for *visham (unpredictable) Pachan* sometimes slowly digests food sometime does not digest and sometimes quickly digests the food.

Tiksnagni (Pitta predominance)– *Agni* is intense and digest food easily and quickly in a short span of time and can even digest heavy meal easily.

Mandagani (Kapha predominance) - *Mandaagni* unable to digest even a small quantity of food and is the opposite of *Tiksnagni*. *Agni* other than *Samagni* i.e *Vishamagani, Tiksnagni, and Mandagani* cause different diseases in the body.

Any disturbance to the digestion process due to *Agni Dusti* either *Mandagni* or *Atyagni* is the causative factor for almost all diseases. When the *Jataragni becomes Manda*, it leads to the buildup of toxic by-products, which cannot be neutralized or eliminated by the body called *Ama*.

Ama (6)

ऊष्मणो अल्पबलत्वेन धातुमाद्यं अपाचितमदुष्टं आमशयगतं रसमामं प्रचक्षते

Due to the reduced *power* of *Agni*, the digestion process is hampered and leads to the formation of *Dusta Ahara Rasa* and further leads to malformation of subsequent *Dhatu* due to the *Dhatvagni Mandya* which often accompanies the *Jataragni Mandya*. Thus, the first *dhatu* formed from *Dusta aahar rasa* will be *Ama Ras Dhatu*, and from *Ama Rasa*, all other six *Dhatu* will be produced which in turn are *Sama Dhatu*s. In *Sutrasthan* 28th chapter, *Acharya Charak* explained different diseases caused due to *Dhatudusti Janya Vikar* have similarities with the clinical features of Hypothyroidism. (7)

Symptoms in each individual are variant according to dominant *Dhatu Dushti* which is affected by *Kal viparyaya, Pragyaparadh, Indriya- Asatmya Sanyoga*. The different symptoms of Thyroid disorder can be correlated to *Rasadi Dhatu Dushti Janyavikara*

Table 01:

<i>Rasa</i>	<i>Rakta</i>	<i>Mamsa</i>	<i>Meda</i>	<i>Asthi</i>	<i>Majja</i>	<i>Sukra</i>
Anorexia	<i>Kustha</i>	Goitre	Signs and symptoms of <i>Prameha</i>	Morbidity of hair and head, as well as nails and beard	Pain in joints, giddiness	Impotency
Anemia	Pimples	Sloughing of flesh				

Impotency	Menorrhagia				
Emaciation	<i>Nilkia</i> (blue moles)				
Premature wrinkle	<i>Vyanga</i> (freckles)				
Premature grey hair	Tilkalaka (black moles)				
Loss of digestive power	<i>Lecoderma</i>				

Hypothyroidism

A butterfly-shaped gland is situated low on the front of the neck between the cricoid cartilage and hyoid bone. The thyroid gland secretes three hormones - Thyroxin (T4), Triiodothyronine (T3), and calcitonin. The term thyroid hormone is restricted to Thyroxin and triiodothyronine and these two have the same biological activity. The interfollicular cells produce calcitonin which regulates calcium metabolism. The Thyroid hormone is responsible for growth and development, callogenesis, central nerves system, intermediary metabolism, cardiovascular system, skeletal system, GIT, haemopoiesis, and reproduction.

The action of thyroid hormones

By active transport T3 and T4 penetrates the cell and by making a combination with a hormone that belongs to rationed and steroid superfamily i.e nuclear thyroid hormone (TR) it produces the majority of its action. (TR isoforms alpha and TR beta both bind T3 and perform similarly, but their tissue categorisation is different, which may account for the quantitative difference in the sensitivity of different tissue to T3). This prompts gene transcription →Production of specified mRNA and specified pattern of protein synthesis →numerous metabolic and anatomic effects. (8) Many of the effects, like increased and irregular heartbeats and blood pressure, tremors, and increased glucose levels in the blood, are at least partly by sensitization of adrenergic receptors to catecholamines. T4 is a major circulating hormone because it is another site of thyroid hormone action – It performs on the cell membrane to increase amino acid and glucose entry in mitochondria to enhance oxygen consumption. At these places, T4 appears to be equipotent to T3, while at the

nuclear receptor T4 has a much lower affinity, even when bound to the TR.

Relationship between T4 and T3 (9)

The thyroid produces more T4 than T3, but in an iodine-deficient state, this difference is decreased.

T3 is 15 times more tightly bound to plasma proteins. T3 is 5 times more potent than T4 and preforms quicker. The highest effect of T3 comes in 1-2 days while that T4 consumes 6-8 days.

T3 is more keenly bound to the nuclear receptor than T4. About 1/3 of T4 is transformed into T3 in thyroid cells, the liver, kidney. Thus, it may be stated that T3 is the active hormone and T4 is mainly a transport form.

Clinical features of Hypothyroidism (10)

In hypothyroidism, the clinical presentation can be widely elaborated by reduced metabolic rate and accumulation of glycosaminoglycan (It is thought that fibroblasts stimulation by thyroid stimulation hormone receptor increase the deposition of glycosaminoglycan which results in osmotic edema and fluid retention). Due to a reduction in the secretion of sweat and sebaceous glands, the skin becomes dry, coarse, cool, and pale. Easy bruising, body hairs flatter dry, and brittle which tend to fall, all of these are caused due to fragility of the capillaries.

Hoarseness of voice is there due to the deposition of GAG in the pharynx and larynx.

In CVS there is a narrowing of pulse pressure and exercise intolerance, reduced cardiac output, and increased systemic vascular resistance which causes diastolic hypertension. Sinus bradycardia and ST-T wave abnormalities and low voltage complexes are some changes presentations in ECG.

Due to reduced gut peristalsis, constipation is present and there is reduced appetite due to modest weight gain also. Diminished blood supply and vasoconstriction in the body there is cold intolerance. Neuro-muscular features include decreased mental and physical function like depression, carpal tunnel syndrome, lethargy agitation, deafness, etc. In adult/young women, it may be linked with decreased libido, no ovulation, poly menorrhagia, menorrhagia, and decreased fertility. In adult men, it may cause decreased libido, oligospermia, and impotence.

Treatment according to Ayurveda:

Deepana Pachan - to increase the Agni, *Pachana Aoushadhas* - to digest the ama and (Thus after increasing the *Dhatvagni*, the *Shodana* has to be done in an attempt to cleanse the *doshas*. If it is in *Leena Avastha* in the *Srotas*, *Doshas* have to be brought to the *Kosta* by *Vruddhi*, *Paka*, *Abhishyandi*, and *Vayu Nigraha*. Once the dosha reaches the *kosta*, *Shodana* can be done. (11)

After *Sodhan* (*Vaman*, *Virechan*, *Vasti* according to *Dosha* predominance), *Jathragni* will be normalised and then the treatment is based on the affected *Dhatu* (which is done by analysing the symptoms). treatment according to prominent symptoms of different *Dhatu* (12). 1)*Rasa Dhatujanya Dosha* – *Langhan* (Starvation). 2)*Rakta Dhatujanya Dosha* –*Raktapitta Samak kriya* (Line of treatment of bleeding disorder), *Virechan* (Therapeutic purgation), *Upvasa* (Starvation), *Raktamokshan* (Bloodletting) 3)*Mamsa Dhatujanya Dosha* – *Samshudhi* (Body cleansing), *Sastra* (Surgical), *kshaar* (Alkali cauterization), *Agni karma* (Cauterization) 4)*Meda Dhatujanya Dosha* – *Chikitsa of Prameha* (Treatment according to Diabetes). 5) *Asthi Dhatujanya Dosha* –*Vasti* with *Teekta dravya Siddha ksheer* and *Ghrita* (Enema with milk and *ghee* processed with bitter taste medicine)

Pathya Aahara (13)

Table 02:

Vegetable	Cereal and spices and other food products	Fruit
Unripe Banana	Gruel of aged rice	Pomegranate
Cooked leaves of <i>Vastuka</i> (<i>Chenopodium</i>)	Soup of <i>Mudga</i> (green gram)	Oranges

6) *Maja and Sukra Dhatujanya Roga* – *Madura* and *Tikta Anna* (Sweet and bitter food, *Vyayam* (Exercise), *Vyavaya* sexual intercourse), *Sudhikale Chamatraya* (Body cleansing depending upon season and dose of medicine)

Saman Chikitsa

VATI-

Aganitundivati- (*Bhaishajya Ratnavali-Agnimandya*)

DOSAGE-125-250mg

Anupana – lemon Juice, worm water

Dose – 125-250mg

Arogyavardhini vati: Rasendrasangraha jwara Rogadhikar

Dose- 120-500mg

Anupan- water, neem juice, milk

Chitrsakadi vati – *charka Chikitsa grahani*

Dose – 125-250 mg

Anupana –worm water

Churna

Hingavastak churna Bhesajya ratnavali, Agnimandya

Dose –1to 3gm

Saindhavaadi churnam Bhesajya ratnavali, Agnimandya

Dose – 1-3gm *Anupan* –worm water, *mamsa ras*, *ghrita*

Triphalaloham –*Rassarasangraha, Agnimandya*

Dose – 125 to 250 mg

Ghritam

Aganighritam – *Chakradata-Aganimandya*

Dose – 3 to 6 *masha*

Karpoorasava - *Bhaisajya Ratnavali Aganimandya*

Dose – 15to 20 ml with an equal amount of water

Leaves and shoots of bamboo branches	Butter milk and worm water	<i>Amalaki</i> (Indian gooseberry)
Cooked leaves <i>Cangeri</i> (Sorrel)	Ginger, coriander seeds, black pepper betel leaves	Lemon
Radish	Honey	
<i>Patola</i> (pointed guard)	Butter, <i>Ghritam</i>	
Cooked leaves of fenugreek	Mustard oil	
<i>Karvellaka</i> (bitter gourd)	<i>Jangala mamsa rasa</i> (Animal dwelling in the dry land forest))	

Vihaar

Vaman (emesis)

Mild *Virecana* (purgatives)

Svedana (fomentation) *Asana* - Different types of exercise and *Asanas*

Pahchimottanasana, vajrasana, pawnamuktasana, Halasana, Mayurasana, Uddiyan, Bandha, kapalbhathi, Nauli, Makarasana, Uttanapadasana, Sarvagasana, Kapalbhathi. (14)

APATHYA

Strong purgative, taking cold water, holding call of nature (*Vega Dharan*, waking up late at night, blood-letting, *Sami* variety of rice, taking irregular meals,

Drinking excess water, Fish, Blackberry, potato, milk, Palm fruit.

jackfruit –Eat banana	Rice – drink stale water
Bananas – Drink ghritam	Drinking water – caraway seeds
Ghritam – Jambira lemon	Thrashed rice –caraway seeds and peeper
Coconut or Palm fruit –Boiled rice	Cucumber –wheat
Mangos –milk	Wheat, <i>Urada</i> pulse, Gram and kidney bean- small quantity seeds of Dhatura
<i>Kisra</i> (ciraunji) - <i>Haritaki</i>	<i>Krishra</i> (pulse and rice mixed)-small quantity of <i>musta</i>
Date, catechu, buttermilk – <i>Neem</i> seeds, <i>Madhuka</i> , <i>Bilva</i> , <i>Paruska</i> , <i>Ghritam</i>	Eating date and <i>Sringataka</i> –dried ginger, <i>Mustaka</i>

DISCUSSION

The thyroid is a metabolic disorder. The thyroid hormone affects all cells of the body by having receptors on the nucleus and also works by increasing the porousness of cell membranes and by increasing the number of mitochondria (15). As mitochondria are the powerhouse of a cell, each cell uses the energy supplied by mitochondria. When there is a greater number of mitochondria, there will be more energy. Thus, derangement in the thyroid level effects the mitochondria which hamper the energy level and metabolic activities of the body. It produces a number of clinical features in multiple systems of the body making it a multi-systemic disorder. The thyroid hormone plays an important role in producing energy just like *Agni* responsible for producing energy in the body by metabolizing *Ahara* to *Sapta Dhatu*.

In contemporary medicine, rather than improving the body to produce the hormone, the hormone is artificially supplemented from the outside. Thus, there is a lifelong dependency on hormonal supplements. In *Ayurveda*, thyroid disorder can be correlated to *Mandagni. Mandatva* at the level of *Jathragni Paka* can be easily cured. Even the disturbance in the *Bhootagni Paka* can also be cured with fewer efforts but derangement at the level of *Dhatvagni Paka* is difficult to treat. Still, the *Agni* at each *Dhatu* level can be treated with *Saman Chikitsha* which includes *Deepana* and *Pachana Aoushadi*.

CONCLUSION

Agni is responsible for all the metabolic functions in the body. *Agni* after acting on *Aahar* produces *Prasad* and *kitta bhaga* and also produces *Mala roopa Dosha* (*vata, pitta, kapha*) at *Jathragni Paaka* stage. The

Dosha and *Dhatu* are the *Moola* of the *Shareera*. Thus, for the proper functioning of the body *Agni* should be always in its *Sama Avasta* (non-vitiated state). *Ahar* (food), *Vihar* plays an important role in keeping *Agni* in *Sama Avastha*. In patients with Hypothyroidism, adopting healthy food habits and lifestyle dependency on hormones can be shattered.

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