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Review Article

PATHOLOGICAL CONSIDERATION OF HYPOTHYROIDISM IN AYURVEDIC CLASSICS

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ABSTRACT

Ayurveda considers diseases are the consequence of *Doshavaisamya* i.e., the imbalance of body humours and health is the state of their equilibrium. Even though hypothyroidism is not directly mentioned in Ayurveda, it can be addressed because Ayurveda doesn't emphasize on naming the disease rather it emphasis on proper understanding of the *Prakruti, Koshta*, *Dosha*, *Dhatu*, *Mala* and *Agni* status of the patient and treat accordingly. Nowadays, hypothyroidism is a common issue encountered in our OPDs. Hypothyroidism has to be carefully addressed as it can lead to other lifestyle disorders like dyslipidemia, coronary artery diseases, hypertension and chronic inflammatory diseases like arthritis. Since the thyroid gland is involved in the metabolic functions of body, its hormonal actions can be correlated to the functions of various levels of *Agni.*

This article is an attempt to conceptualize hypothyroidism in terms of Ayurvedic pathophysiology to facilitate further understanding and to provide better treatment options.

INTRODUCTION

According to Ayurveda diseases are the consequence of *Doshavaihsamya* i.e., the imbalance of body humours and health is the state of their equilibrium[1]. *Doshas* are the causative factors of all diseases[2]. Acharya Caraka in the Sutrasthana '*Trisothiya'* chapter narrates that it is not possible to attribute specific name to all pathological conditions and unspecified conditions should be treated according to the aetiological factors, *Dosha* involved and organ involved or by looking into the clinical presentations[3].

Hormonal secretions vary with the day-night, sleep-awakening, cold- hot atmosphere, age, emotional status etc. similar to that of *Dosha* in human body. There is uniqueness in the rhythmic variation of endocrine secretions and *Tridoshas*. Though this rhythmic variations and hypothalamo pituitary thyroid axis was explained recently in modern science, the latter was explained long years ago in the Ayurvedic system ("*Vayo ahoratri bhukthaanam te antah madhyadigah kramath*"). Due to uniqueness of *Tridosha* theory, Ayurveda is still in the service of humanity from centuries.

Many diseases and syndromes gradually adding to the nomenclature of human pathologies in the contemporary medical system are not being namely recognized in Ayurveda. The comparison of any newly emerged pathological condition as per western thought with any disease as per Ayurvedic thought is essential for prevention and treatment of that disease. Considering the clinical features and pathogenesis we can include following clinical conditions described in Ayurveda for a discussion to compare with hypothyroidism.

Analysis of Hypothyroidism with respect to Ayurvedic Pathologic Conditions

Agnimandya

Agni has got prime importance in Ayurvedic physio-pathology. The first *Sukta* of *Rigveda* begins with *Agni*, '*Agni mile purohitam'* means *Agni* is the *'Purohita'*, the conductor of rituals to protect the *'Pura'* or the body. In the rough sense *Agni* means fire. Sun is the *Agni* in the universe, which exists in human body as the *Kayagni.* So, in the functioning of a living organism it is inferred by its *Pakadi karma* i.e., various metabolic

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processes. Broadly three kind of *Agni* have been mentioned in *Samhita*.

I. *Jataragni*
II. Five *Mahabhuatagni*[4]
III. Seven *Dhatvagni*

Jataragni is given higher position among them, which is mainly concerned with chemical processes involved in gastro-intestinal digestion. *Bhutagni* is related to the *Panchamahabhuta paka.* The *Dhatvagni* is concerned with the transformation as well as production of new basic tissues (*Dhātu*) and its associates.

Acharya *Caraka* considered *Agni* as a separate entity coming under the category of *Pitta* by saying '*Agnireva sarire pittantargat'*, however *Suśruta* considered *Agni* is nothing but *Pitta* in human body[5]. It is attributed with functions like *Pacana* (digestion), *Dahana* (burning combustion or oxidation) including *Bhinnasamghata* (splitting), *Tapana* (heat production), *Parinamana* (conversion), *Paravrtti* (transformation), *Prakasana* (illumination), *Ranjana* (colouration) and *Prabhakara* (to cause luster) in human body[6]. So we can infer that the concept of *Agni* includes all sort of enzymatic as well as hormonal activities involved in the process of maintaining body metabolism which is similar to the profound influence of thyroid hormones[7] on the tissue metabolism. The functions of thyroid hormones can be correlated with the action of *Dhatwagni* and *Bhutagni*. Thyoxine is involved in the cellular metabolism of glucose, amino acid and fat. Moreover, its functions can be correlated with *Alochaka pitha* with respect to its action in the brain (*Budhir vaiseshika*) and sensory organs (*Chakshurvaiseshika*). It is evident that deficiency of thyroid hormone in pregnancy can lead to mental retardation of the child. In adult person it can lead to cognitive decline and loss of memory, which can be attributed to the functional decline of *Budhir vaiseshika*. Hypothyroid subjects can develop decreased sensation of taste, vision and hearing, which is due to the functional decline of *Chakshurvaiseshika*.

In hypothyroidism nearly all *Dhatus* are functionally impaired, which is due to *Dhatvagnimandya*. As a result *Dhatus, Updhatus* as well as *Mala* production are deranged which is evident from the symptoms like loss of appetite, improper digestion, weight gain, heaviness of body, lethargy, generalized aches, slowness, constipation etc. Cellular metabolism will be affected resulting in systemic disorders. Normal functioning of all *dhatus* will be disturbed and their *Dushti lakshanas* will manifest in the body. In the initial phase of *Dhatwagnimandya, Rasadhatu* is mainly involved. Hence *Dushti lakshanas* of *Rasadhatu* is more evident in the primary stages of hypothyroidism.

Involvement of *Sapta dhatus* and their *Srotas* in the pathology of Hypothyroidism

Signs and symptoms of hypothyroidism can also be analyzed with *Sapta dhatu* vitiation.

Rasadhatu Vikriti

Due to *Datwagni mandaya*, primarily the *Rasa dhatu* is affected. The symptoms of *Rasa pradosha* (due to vitiated *Rasa*) like *Asradha*– poor concentration, *Aruchi*- lack of interest in food intake, *Gourava*-heaviness, *Tandra*- lethargy, *Angamardam* – generalized body ache, *Panduthwam*- anemia, *Srotasam rodham*- artherosclerotic changes, *Agninasam*- loss of appetite are seen in hypothyroidism. This may be due to improper formation of *Rasadhatu* along with accumulation of *Malarupa kapha*. A hypothyroid person mostly presents with symptoms of *Kapha vrudhi* like *Seethadwesham*- cold intolerance, *Gouravam*-heaviness of the body, *Staimityam*- fixedness, immobility, *Sopham*- swelling whole body, *Apakti*-indigestion, *Atinidrata*- excessive sleepiness and along with above said *Rasa dushti lakshanas*.

Weakness is caused by vitiation of *Rasa dhatu* and *Mamsa dhatu* as well as depletion of *Oja*. Dry skin with decreased sweating is caused by vitiation of *Rasa*, *Rakta dhatu* and *Mamsadhatu*. Oligomenorrhoea and amenorrhea are caused by the vitiation *Rasa* and *Rakta dhatu* as *Artava* is the *Upadhatu* of *Rasa*. Paresthesia as well as muscle cramp are caused by vitiation of *Rasavaha srota* and *Mamsa dhatu*. Impaired hearing is due to vitiation of *Rasa dhatu*. Hair loss is due to vitiation of *Pitha* along with *Vata dosha* as well as vitiation of *Rasa dhatu*. Periorbital oedema and odema in peripheral parts of the body is caused by vitiation of *Twak (Rasa dhatu)*, *Shonitha* i.e., *Rakta dhatu* and *Mamsa dhatu* as described in the pathogenesis of *Sotha*. Cardiac arrhythmia is caused by vitiation of *Rasa dhatu*. Drowsiness or sleepiness is caused due the vitiation of *Rasavaha srotas* along with depletion of *Oja*. Decreased libido in both sexes is caused by vitiation of *Rasavaha srotas*. Hence initially there is vitiation of *Rasa dhatu* and subsequent accumulation of *Kapha dosha* resulting in *Srotorodha*. The *Srotorodha* is systemic such that it affects the *Saaratha* of *Utharothara dhatu* and finally affect the spermatogenesis and oogenesis (*Sukla dhatu* functioning).

Anemia is diagnosed in 20-60% of hypothyroid subjects. Often the anemia is Macrocytic or Normocytic in nature. This can be attributed to *Rasa dhatu dushti* followed by improper formation *Rakta dhatu*. Directly or indirectly thyroid hormones have an influence in erythropoiesis just like *Rasadhatu* functioning.

Mamsa - medo dhatu dushti

Benign growth is like *Galaganda*, *Gandamala* are mentioned in *Charaka samhitha Sutra sthana*, as *Mamsa pradoshaja vyadi*. *Galaganda*, which is often correlated to goiter is a major physical finding in hypothyroidism and thyroiditis. A swelling cannot grow without *Vata*. So it can be inferred that *Mamsa dhatu* is also vitiated with *Dooshitha kapha*, and *Vata dosha* to form a swelling as in hypothyroidism. As a part of *Medo dhatu* involvement the patient may present with *Sthoulya*, PCOD, insulin resistance, dyslipidemia and metabolic syndrome in the long run.

***Asthi* and *Majja Dhatu*:** Decreased bone health is observed in hyperthyroidim as it increases the osteoclastic activity. Bone health is normal in the initial phases of hypothyroidism but on overt treatment with Levo thyroxine can decline the bone health. So *Asthi – Majja dhatu kshaya* occurs resulting in hair loss (*Kesa satha*) and osteoporosis *(Asthi kshaya*).

Sukra* and *Artava: Due to the involvement of *Sukradhatu* and *Arthava* there will be decreased libido, irregular menstruation and amenorrhea.

Symptoms of *Srotodushti* seen in Hypothyroidism[8]

***Pranavaha*:** Hoarseness of voice

Annavaha: Loss of appetite, improper digestion and assimilation

Rasavaha: Weight gain, loss of appetite, heaviness of body, lethargy, generalized aches, somnolence, premature aging symptoms like hair loss, cold intolerance, puffiness, anaemia, menstrual disturbances, infertility, lack of concentration, decreased hearing, non-pitting oedema, pericardial effusion, abdominal distension.

***Rakthavaha*:** Slow pulse rate, dry skin, slowing of mental activity, lethargy, anaemia.

***Mamsavaha*:** Oedema, *Galaganda*

***Medovaha*:** Tiredness, sleepiness, sluggishness, hyperlipidemia, dyspnea on exertion

***Asthivaha*:** Osteoporosis, osteoarthritis, hair loss, coarse, brittle straw like hair

***Majjavaha*:** Osteoporosis

***Sukravaha*:** Loss of libido, infertility

***Purishavaha*:** Constipation

***Swedavaha*:** Dry and coarse skin, absent/minimal sweating

***Artavavaha*:** Loss of libido, infertility, secondary amenorrhea

***Manovaha*:** Depression, lack of concentration, dull facial expression, mental impairment and forgetfulness.

From the above symptoms we can infer that vitiated symptoms of almost all *Srotas* are seen in hypothyroidism. There is involvement of all seven *Dhatus* along with their *Srotas* and hence simulating the features of *Maharoga*. If the condition is not properly treated it can lead to grave outcomes.

Kaphavrutha Vata

Kapha-Avarana is again another important concept in Ayurveda that resembles hypothyroidism especially in the description of *Acarya Sušruta.* The literary meaning of word '*Avarana'* is covering, physiologically it can be considered to be the obstruction of the function. *Susruta* explains symptoms of *Kaphavrta vata* as A*sweda* (reduced sweating), *Aharsa* (loss of libido), *Mandagni* (loss of appetite), *Sita* (feeling cold) and *Stambha* (inertia in movements) which can be seen in hypothyroidism[9]. Feeling of coldness, heaviness, and frequent aches and pains as explained in *Ashtanga Hrudaya* in the context of *Kaphavrutha vatha* are definite features of hypothyroidism.

Kaphaja Sopha

Another important pathological entity which can be correlated with hypothyroidism is *Sopha* especially *Kaphaja Sopha*. The main feature of *Sopha* is heaviness and raised appearance. *Sopha* is very evident in Myxedema, a type of hypothyroidism.

Pandu

Hypothyroidism and *Pandu roga* are similar in clinical features (*Lakshana*). In hypothyroidism there is diminished synthesis of thyroid hormones which can be attributed to hypo function of *Datwagni*, as seen in *Pandu*, where there is less production of different tissue element like *Rasa* and *Raktha*.[10]

Decreased level of T3 & T4 in circulating blood can be interpreted as *Gunata Rakta kshaya.* When there is no deficiency of iodine, auto immune disease (Hashimoto's thyroiditis) is the most common cause of hypothyroidism. In Hashimoto's thyroiditis there is marked lymphocytic infiltration of the thyroid with germinal center formation, atrophy of the thyroid follicles accompanied by oxyphil metaplasia, absence of colloid and mild to moderate fibrosis[11]. Autoimmune inflammatory reaction is induced by vitiation of *Pitha dosha,* mainly due to vitiation of *Ushna, Tikshna* and *Katu guna* of *Pitha[12]*. Lymphocytic infiltration can be compared with vitiation of *rakta dhatu*, absence of colloid in thyroid tissue with vitiation of *Rasa dhatu* and cellular metaplasia and fibrosis (in relation with destruction of protein-lipid-protein-structure of cellular wall) with vitiation of *Mamsa* and *Medo dhatu*. Atrophy of thyroid follicles can be termed as consequence of obstruction of channels, mainly *Rasavaha, Raktavaha, & Mamsavaha srotas*- the chief source of cellular nutrition.

Although there is very little clinical evidence available regarding the role of stress in the pathogenesis of autoimmune hypothyroidism[13], theoretically stress has very significant influence in the

functioning of hypothalamo-pituitory–thyroid axis. The various psychological factors like *Kama, Chinta, Bhaya, Krodha, Upahata chetasa* etc mentioned under the causative factors of *Pandu roga* can be compared with stress. The features of *Pandu* like heaviness, *Dhatu saithilya, Ojokshaya, Alpa rakta*, lack of *Samhanata*, cold intolerance are present in hypothyroidism.

Galaganda

The term *'Galaganda'* consists of two parts *'Gala'* and *'Ganda'*. *Gala* is derived from the root *'Gr galati*, *Galati* means to drip out or to swallow[14]. *'Ganda'* means *'Sphotaka'* or *'Granthi* i.e., a swelling mass. Hence *Galaganda'* literaly mean swelling in the neck region. Monier William translated it as goitre. *Suśruta* commentators B.G Ghanekar, K.I. Bhisagratnam and P.V. Sharma had also accepted it as goitre. In *Galaganda*, *Kapha* and *Vata dushti lakshanas* are more than *Pitha* and its origin is in the *Kanta* i.e., neck, similar to hypothyroidism.

When *Vata, Kapha* along with *Meda* reaches neck region they gradually develop a swelling mass resembling the shape of a scrotum. Swelling is the most important and only general feature described by all authors. Though Caraka differs in the process of pathogenesis and involvement of *Dosas* and *Dhatus* (i.e., *Kapha* and *Mamsa*), he had also mentioned local oedema as the only general feature. In some versions of *Ashtangahrdaya* above symptom has been told to be accompanied by severe pain (Atiruk) (A.H. Hemadri & Arunadatta commentary) but commentator Indu and Shivadas Sen have accepted it as 'Niruk' i.e., without pain[15]. The painful variety can be compared with thyroiditis and non painful to non inflammatory Goitre.

The disease '*Galaganda'* deals with a localized swelling only, i.e., in the neck. The clinical features of swelling in *Galaganda* are similar to the neck swelling in hypothyroidism. Nowadays a pure goitre like enlargement is not usually seen, may be because of global iodization, increased awareness of iodine deficiency diets and timely diagnosis. In hypothyroidism other signs like slow movements, periorbital puffiness, coarse skin, cold intolerance, reduced metabolism are reflected more than a localised neck enlargement. So we can infer that *Galaganda* as a localised swelling, not necessarily needed to be present in hypothyroidism and if present, it is only a symptom in the pathogenesis of hypothyroidism. So the treatment modalities enumerated in the classics for *Galaganda* can be adopted to a certain extend in the management of hypothyroidism.

CONCLUSION

The symptoms of hypothyroidism are nonspecific and vary from person to person. *Agnimandya, Kapha Vrudhi* and the resultant *Srotorodha* are the main pathologic manifestations that can be encountered in the above mentioned pathologies. So the treatment methodologies explained in each of pathologies can be judiciously incorporated in the treatment of hypothyroidism.

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