



Hypothyroidism in Ayurveda- A Noval Concept

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Abstract:

There is no direct description of the disease Hypothyroidism in the classics of *Ayurveda*. Most *Ayurvedic* physicians correlate Hypothyroidism with *Galaganda* which is mentioned in the classics as swelling in the neck. *Galaganda* resembles Goitre however Goitre has other causes too apart from hypothyroidism. Some scholars even co-relate *Kaphaja soth* with myxedema of hypothyroidism due to presence of non pitting oedema. All these are but a few clinical features of hypothyroidism where the manifestation is due to defective tissue metabolism. . The main function of Thyroid Hormone is to control the rate of metabolism in the tissues. In Hypothyroidism this rate is slowed down and there is decreased tissue metabolism. This slows down the rate of ATP synthesis, protein synthesis, hampers carbohydrate and lipid metabolism. The hypometabolism that occurs in hypothyroidism is similar to the concept of *Manda Agni*. *Manda Agni* leads to the various clinical features similar to features of Hypothyroidism. Accumulation of sub-metabolites like glycosaminoglycans in hypothyroidism, can be co-related with *mandagni* at the tissue (*dhatu*) level where decrease in *dhatwagni* leads to formation of abnormal *dhatu*(1). Hence we can incorporate the concept of *Mandagni* in the treatment of hypothyroidism for better management..

Key words: Hypothyroidism, Hypometabolism, Tissue metabolism, Mandagni, Dhatwagni.

Introduction:

A very common endocrine disorder encountered by physicians in practice nowadays is Hypothyroidism (2). Hypothyroidism results from reduced thyroid hormone actions at the peripheral tissues. Thyroid hormones influence the functioning of nearly all organ systems right from conception to death. It is essential for growth and development, nervous system myelination, metabolism and organ functions. For normal physical and mental development of an individual Thyroid hormones are of critical importance. Deficit or excess of Thyroid hormone during development can have permanent, pervasive, and profound effects on adult neurological function.

In hypothyroidism the underlying problem is slowing of many physiologic processes and the clinical manifestations reflect that slowing. Symptoms appear in almost every organ system of the body and vary from mild to severe and from person to person. Due to defect in metabolism there is increased synthesis of hyaluronic acid leading to accumulation of matrix glycosaminoglycans in the interstitial fluids. This and other metabolic changes explain many of the clinical symptoms and signs reported by individuals who have hypothyroidism (3).

Symptoms of hypothyroidism are subtle and are notorious for their nonspecific nature. Some common symptoms are lethargy, fatigue, weight gain, feeling of heaviness, dry skin, dry hair, hair fall, cold intolerance, menstrual irregularity, infertility etc.

Diagnosis of Hypothyroidism is determined on the basis of the thyroid profile tests. The normal range of TSH concentration is between 0.45 - 4.5 mU /L which may vary slightly depending on the

procedure followed in different laboratory. However most of the patients nowadays have subclinical hypothyroidism with vague features and diagnosed accidentally when they come to the doctor with other complaints. In Subclinical, or mild hypothyroidism

(Mildly underactive thyroid), also called early-stage hypothyroidism, thyrotropin (TSH) levels start to increase in response to an early decline in T4 levels in the thyroid. However, blood tests for T4 are still normal. The patient may have mild symptoms (usually slight fatigue) or none at all.

The treatment of hypothyroidism is simple and easy even then the management of hypothyroidism poses a lot of problem. The commonly used hormone replacement therapy in allopathic system is effective in maintaining a euthyroid status but does not give complete relief of symptoms. Following thyroid hormone replacement, although levels of circulating TSH in the reference range typically indicate normal levels of intracellular T3 to the hypothalamus and pituitary, there are several mechanisms by which such a normal TSH level may fail to indicate intracellular euthyroidism in other tissues and thyroid hormone action in the tissue level is hampered.

Most people with thyroid hormone replacement report not feeling well despite having normal hormone level. The complaints of lethargy, fatigue, weight gain, psychological slowing etc remain and continue to create problems (4,5). Besides, replacement therapy needs regular monitoring and dose adjustment(6). To overcome these lacunas with hormone replacement therapy many scholars have tried different combinations and alternatives and the research is still on without much success(7).

In this context an alternative approach with the principle of *Mandagni* in *Ayurveda* shows promising results. Since in Hypothyroidism the main underlying pathology is hypometabolism, it seems to fit into the concept of *Mandagni* given in *Ayurveda*.

Ayurveda has given a very intelligent concept of *Agni* and *Pitta*, where any chemical reaction taking place in the body needs *Pitta* and the function is represented by *Agni*. During the process of digestion *Agni* is the most important element at all stages, more specifically the 13 *Agni* (1 *Jathargni*, 5 *Bhutagni*, & 7 *Dhatwagni*). The food we ingest is acted upon by *Jatharagni* in the *mahakostha* and broken down into smaller particles by *Pithar Paka*. After digestion at the *Jatharagni* level, the *Ahar rasa* is acted upon by the *Bhutagni* to transform the *pancamahabhuta* of the ingested *vijatiya* food substances. By the action of the 5 *Bhutagnis* the *vijatiya pancamahabhutas* are transformed into *sajatiya pancamahabhutas* of the body by *Pilu Paka* and made compatible to the tissues of the body. These *sajatiya panchamahabhutas* can now be utilised by the body. They are acted upon by the 7 *dhatwagnis* to form the 7 specific *dhatu*s of the body i.e *Rasa, Rakta, Mamsa, Meda, Asthi, Majja, Sukra*, their *upadhatu*s and *mala*, which provides structural integrity and maintains nutrition of the body. Thus proper digestion and metabolism at all stages is very essential and for this, normal status of *Agni* is a must. If the status of *Agni* is impaired, digestion and metabolism is hampered and functions of the body get impaired causing various diseases(8,9,10)

On the basis of strength four types of *Agni* is mentioned in *Ayurveda*:

- a) *Samagni*
- b) *Visamagni*
- c) *Tikshnagni*
- d) *Mandagni*

Out of these, *Mandagni* is considered as the root cause of all disease. In *Mandagni* the digestive and metabolic capacity of a person slows down. The person is not able to digest even small quantity of food (12). This in turn hampers proper nutrition to the tissue and leads to various diseases especially metabolic diseases. Aims and Objective:

- To study the concept of Hypothyroidism in Modern Science.
- To study the concept of *Mandagni* in *Ayurveda*
- To correlate the similarities in the pathogenesis of *Mandagni* and Hypothyroidism.

Materials and method:

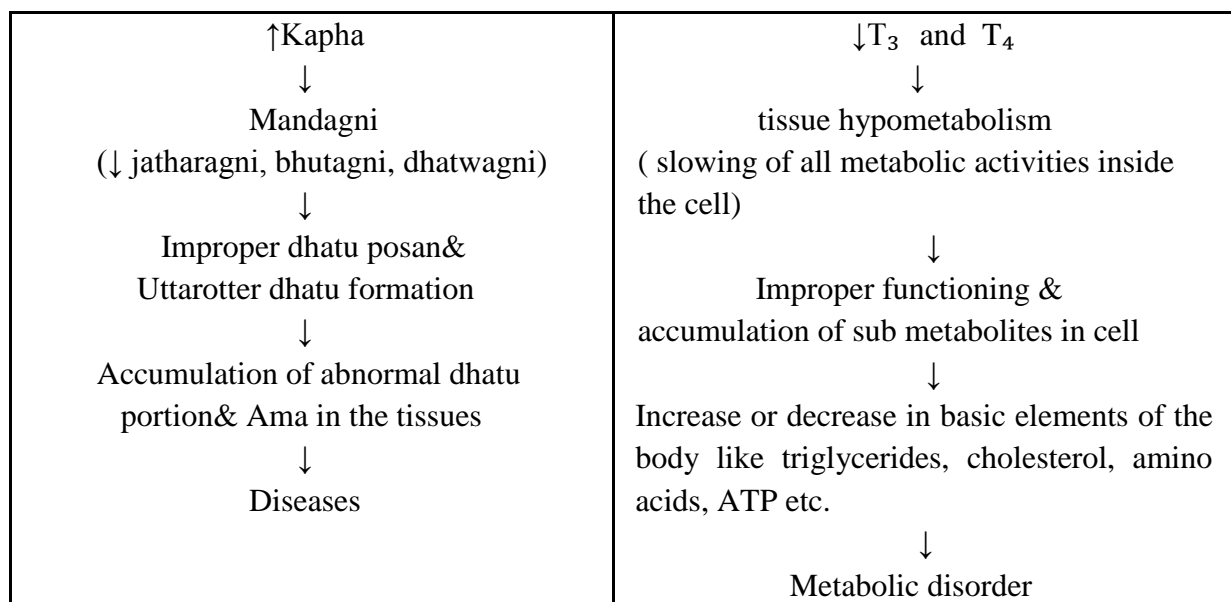
The study is carried out by review of literature related to Mandagni as well as Hypothyroidism. A possible correlation is made by critically analysing the various similarities between Mandagni and hypothyroidism.

Result and discussion:

Agni is the most important and basic element in thermogenesis and metabolism in the body. All chemical reactions taking place inside the human body needs the fuel of Agni. Agni converts *Ahar dravyas*(food) into *Ahar rasa* and with the help of *dhatwagni* and *bhutagni* this *Ahar rasa* is transformed into *posak amsa* of the body for nutrition and maintainance of the body. Hence, any defect or vikriti like hypo or hyper functioning of the agni leads to diseases. In case of *Mandagni*, where a person is not able to digest or metabolise the *Ahar rasa* properly, nutrition to the tissues becomes insufficient. If the *mandagni* is at the *dhatu* level decreased *dhatwagni* leads to improper *dhatu* formation and accumulation of abnormally formed *dhatu*s. Besides due to *Mandagni*, *Ama* formation occurs leading to hordes of different complications which in modern can be related to the autoimmune diseases(11).

Though there is no description of the disease hypothyroidism in *Ayurveda*, the features of hypothyroidism can be correlated to the features of *Mandagni*. In Hypothyroidism the basic pathology is hypometabolism. The main function of Thyroid Hormone is to control the rate of metabolism in the tissues. In Hypothyroidism this rate is slowed down. This slows down the rate of ATP synthesis, protein synthesis, hampers carbohydrate and lipid metabolism. The hypometabolism that occurs in hypothyroidism is similar to the concept of *Manda Agni*. Other diseases in *Ayurveda* that are correlated with hypothyroidism are *Galaganda* and *Kaphaja soth*. But these are just some of the various clinical features of hypothyroidism where the underlying cause is increased *kapha*. The increased *kapha* manifesting as *manda Agni* leads to the various clinical features similar to features of Hypothyroidism.

Critical analysis of pathophysiology of *Mandagni* viv-a-vis Hypothyroidism can be summarised as below:



Increase in the bodily humor *Kapha* leads to *mandagni* and vice-versa. Due to *Mandagni* metabolism does not occur properly. Improper metabolism leads to improper nutrition to the tissues and improper formation of subsequent *Dhatu*s. As mentioned by *Vagbhat*, decrease in *dhatwagni* leads to accumulation of abnormal *dhatu* portions. There may also be accumulation of partly metabolized substances (*Ama*) in the tissues leading to various diseases.

Similarly, in Hypothyroidism metabolic processes in the tissues slows down due to inadequate active thyroid hormone (decreased level of free T₄). The reactions that need thyroid hormone get slowed down or are hampered. There may be accumulation of sub-metabolites like glucosaminoglycans and improper cartilage formation (12), improper protein synthesis, improper carbohydrate and lipid metabolism. Energy metabolism and utilization is hampered. On the whole the entire metabolic system of the cell get deranged, the cellular function is hampered leading to various symptoms.

Mention of the condition of *Mandagni* is found aplenty in the texts of *Ayurveda* but in most of them *Jatharagni mandya* has been the subject of discussion. In most of them. No clear description of *bhutagni* and *dhatwagni* is found in any of them. *Acharya Vagbhat* has briefly mentioned *dhatwagni* while telling about *Dhatu Briddhi* and *Kshaya*. He says that a portion of *kayagni* enters the *dhatu*s and cause *Kshaya* (decrease) and *Briddhi* (increase) of the *Dhatu*s. Decrease in *dhatwagni* lead to increase in the *rasa dhatu* and *uttorotter dhatu*s while increase in the *dhatwagni* lead to decrease in the *dhatu*s. However it is apparent that this increase or decrease is an abnormal state and the *dhatu*s that are produced as a result are also not normal. This is in tandem with increase and decrease of certain metabolites in the condition of hypothyroidism. In Hypothyroidism also due to decreased tissue metabolism there is unwanted increase or decrease of essential elements of the body. Study shows that in Hypothyroidism there is diminished fatty acid synthesis in retroperitoneal fat and had similar, although not significant, effects in epididymal fat. In brown adipose tissue, lipogenesis increased in hypothyroidism. In hypothyroid animals, lipogenesis primarily occurs in skin, bone, muscle, and other nonresponsive organs leading to obesity, however Fatty acid synthesis in brain, lung, skin, and bone and muscle did not respond to changes in thyroid state (15).

Thyroid hormones influence all major metabolic pathways. Their most obvious and well-known action is an increase in basal energy expenditure obtained acting on protein, carbohydrate and lipid metabolism. With specific regard to lipid metabolism, thyroid hormones affect synthesis, mobilization and degradation of lipids, although degradation is influenced more than synthesis. The main and best-known effects on lipid metabolism include: (a) enhanced utilization of lipid substrates; (b) increase in the synthesis and mobilization of triglycerides stored in adipose tissue; (c) increase in the concentration of non-esterified fatty acids (NEFA); and (d) increase of lipoprotein-lipase activity. In Hypothyroidism all these reactions are hampered. While severe hypothyroidism is usually associated with an increased serum concentration of total cholesterol and atherogenic lipoproteins, even in subclinical hypothyroidism, which is characterized by raised serum TSH levels with normal serum thyroid hormone concentrations, mild hyperlipidemia is present and may contribute to an increased risk of atherogenesis. There is increase in cholesterol and LDL which manifests as obesity and increase in weight of the person. This is due to improper lipid metabolism (16). Protein metabolism is also hampered leading to accumulation of sub metabolites. Due to decreased thyroid hormone initiation, there is decrease in ATP production and energy metabolism is hampered. Patient feels Lethargic and Fatigued. Improper metabolism leads to impaired nutrition and impaired growth and development and a variety of unspecific symptoms resulting from hypometabolism.

If we compare the clinical feature of *Mandagni* with the clinical feature of hypothyroidism we see many similarities. These features manifest due to improper metabolism in the tissues. Thus it is quite obvious that these features will match the features manifested due to *Mandagni*. So, we can safely relate Hypothyroidism with *mandagni*, more specifically *manda dhatwagni* and plan the treatment accordingly.

Comparison of clinical features of *Mandagni* manifested as the disease *Agnimandya* with some clinical features of hypothyroidism.

Sl no.	Clinical features of mandagni	Clinical features of hypothyroidism
1. 1.	<i>Matrabhuktwanavipacyate</i> (indigestion)	Indigestion
2. 2.	<i>Chardi</i> (vomiting,nausea)	
3. 3.	<i>Sada</i> (glani)	Fatigue/lethargy
4. 4.	<i>Prasek</i> (salivation)	
5. 5.	<i>Siragaurav</i>	Feeling of heaviness in head
6. 6.	<i>Gatragaurav</i>	Feeling of heaviness in body, weight gain
7.	Features of <i>kapha briddhi</i>	Weight gain, cold intolerance

Conclusion:

Role of *Agni* is emphasised a lot in *Ayurveda*. Most of the diseases are said to be due to *Mandagni*. The disease hypothyroidism is not mentioned in *Ayurvedic* classics and there are no effective medicine choices for it, so it's high time that we concentrate a bit on this disease from *Ayurvedic* point of view as its incidence is increasing day by day and people seek *ayurvedic* treatment for such chronic diseases. The problems that come with hypothyroid condition are mainly due to hypometabolism in the tissues. Treatment with hormone replacement maintains the euthyroid status (normal TSH level) but does not treat the hypometabolic state leading to continuation of the symptoms. The complaints of lethargy, fatigue, weight gain, psychological slowing etc remain and continue to create problems. If we approach for the treatment of Hypothyroidism by enhancing the metabolism in the tissues then most of the features due to tissue hypothyroidism can be overcome and by feedback mechanism euthyroid status can also be achieved. In other words if we increase the *Agnibala* of the patient, more specifically the *Dhatwagni* then this condition of tissue hypothyroidism can be reversed.

Approach to treatment in the line of management of *mandagni* as mentioned in *Ayurveda* can be utilised to overcome the shortcomings of conventional allopathic therapy in hypothyroidism which usually requires lifelong monitoring and continuation without much symptomatic relief.

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