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A REVIEW ON AYURVEDIC PERSPECTIVE OF THYROID DISORDERS

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ABSTRACT

Thyroid gland disorders are growing worldwide health issue. Thyroid hormone regulates metabolic rate of the body. Failure of thyroid hormone to maintain metabolic rate mainly produces hyperthyroidism or hypothyroidism. Thyroid disorders are characterized by physical and mental abnormality. There is no exact correlation of thyroid gland in Ayurveda. But the Ayurvedic system of medicine is very futuristic and it doesn't emphasize on naming the disease. It rather insists on understanding the constitutional status of a disease and adopting an appropriate treatment principle. The main action of thyroid hormone is to act as a spark to start-up body metabolism at cellular level. In Ayurveda, it can be correlated with the actions of agni. The agni located in the jathara (digestive fire) is responsible for digestion and absorption of the food. The bhutagni is responsible for transformation of heterogeneous substance to homogenous substances. The dhatwagni (the agni located in the body tissues) along with bhutagni are responsible for the metabolism. Also the symptoms of hypothyroidism and hyperthyroidism can be correlated with imbalanced doshas. These concepts of Ayurved could be considered to understand thyroid disorders from ayurvedic perspective. As modern treatment has many adverse effects, it is important to understand thyroid disorders from Ayurvedic perspective to give safe and effective ayurvedic management.

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INTRODUCTION

Thyroid disorders are the most common disorders we see in today's world. The function of thyroid gland under normal condition is to maintain body metabolism. This action is carried out by the hormones produced by thyroid gland. The failure of these hormones to maintain normal metabolic rate in body produces two most common conditions either hypothyroidism or hyperthyroidism. Under-function of thyroid gland reduces production of thyroid hormone which decreases body metabolism and give rise to many sign and symptoms like fatigue, constipation, dry skin, etc. all together included under heading of hypothyroidism. Similarly, over-function of thyroid gland increases metabolic rate of the body by increasing the thyroid hormones and leads to various conditions like weight loss, anxiety, tremors, etc. which are together called as hyperthyroidism. So as the main action of thyroid hormone is to maintain proper metabolism in the body, in Ayurveda, it can be correlated with the actions of agni.

Normal agni in the body maintains normal body metabolism. According to the different functions and sites of action, agni is of 3 main types. The agni located in the jathara (digestive fire) is responsible for digestion and absorption of the food. The bhutagni is responsible for transformation of heterogeneous substance to homogenous substances. The dhatwagni (the agni located in the body tissues) along with bhutagni are responsible for the metabolism. Proper amount of agni in body i.e. kayagni or dehagni are responsible for normalcy in the body. And imbalanced agni is responsible for disease condition in the body. Though all the terms and conditions of thyroid disorder cannot be explained as it is according to Ayurved but the concept of Ayurved for development of any diseases can help to understand thyroid disorders. Here an attempt has been made to understand thyroid disorder from ayurvedic perspective to give safe and alternative management.

Prevalence

About 200 million people in the world have thyroid diseases. Both hypothyroidism and hyperthyroidism are fairly common in human population. Women's are 2-10 times more likely to

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develop these two conditions. In India also thyroid disorders are the most common among all the endocrine diseases.

Physiological effect of Thyroid Hormone

There are two major metabolic thyroid hormones T3 and T4 which affect virtually every cell in the body and at all stages of life. These help in proper development during the fetal period and the first few months after birth. Thyroid hormones also promote growth as they enhance amino acid uptake by tissues and enzymatic systems involved in protein synthesis thus promoting growth and development. Thyroid hormone stimulates diverse metabolic activities of most tissues and leading to specific metabolic effects like^[1]

- **Action on Basal Metabolic Rate (BMR)**

Thyroxine increases the metabolic activities in most of the body tissues, except brain, retina, spleen, testes and lungs. It increases BMR by increasing the oxygen consumption of the tissues.

- **Action On Metabolism**

Protein metabolism: Thyroid hormone increases the synthesis of proteins in the cells. Though thyroxine increases synthesis of protein, it also causes catabolism of proteins.

Carbohydrate metabolism: Thyroid hormone stimulates glucose uptake, glycogenolysis, and gluconeogenesis to generate free glucose which provide energy to the body.

Lipid metabolism: They help in fat metabolism by mobilizing lipids from adipose stores and accelerate oxidation of lipids to produce energy (occurs within mitochondria), as well as increasing the size and number of mitochondria. Thyroxine decreases the fat storage by mobilizing it from adipose tissues and fat depots. The mobilized fat is converted into free fatty acid and transported by blood. Thus, thyroxine increases the free fatty acid level in blood.

- **Action on body Temperature:** Thyroid hormone increases the heat production in the body, by accelerating various cellular metabolic processes and increasing BMR.
- **Action on Growth:** Thyroid hormones have general and specific effects on growth. Increase in thyroxine secretion accelerates the growth of the body, especially in growing children.
- **Action on body Weight:** Thyroxine is essential for maintaining the body weight. Increase in thyroxine secretion decreases the body weight and fat storage. Decrease in thyroxine secretion increases the body weight because of fat deposition.
- **Action on Blood:** Thyroxine accelerates erythropoietic activity and increases blood volume. It is one of the important general factors necessary for erythropoiesis.
- **Action on Cardiovascular System:** Thyroxine acts directly on heart and increases the heart rate, force of contraction of the heart & vasodilatation by increasing the metabolic activities. This in turn, increases the blood pressure.
- **Action on Gastrointestinal Tract:** Generally, thyroxine increases the appetite and food intake. It also

increases the secretions and movements of GI tract. So, hypersecretion of thyroxine causes diarrhoea and the lack of thyroxine causes constipation.

- **Action on Central Nervous System:** Thyroxine is very essential for the development and maintenance of normal functioning of central nervous system (CNS). Thyroxine is very important to promote growth and development of the brain during fetal life and during the first few years of postnatal life.
- **Action on Skeletal Muscle:** Thyroxine is essential for the normal activity of skeletal muscles. Slight increase in thyroxine level makes the muscles to work with more vigour. But, hypersecretion of thyroxine causes weakness of the muscles due to catabolism of proteins.
- **Action on Sleep:** Normal thyroxine level is necessary to maintain normal sleep pattern. Hypersecretion of thyroxine causes excessive stimulation of the muscles and central nervous system. So, the person feels tired, exhausted and feels like sleeping. But, the person cannot sleep because of the stimulatory effect of thyroxine on neurons. On the other hand, hypo secretion of thyroxine causes somnolence.
- **Action on sexual Function :** Normal thyroxine level is essential for normal sexual function. In men, hypothyroidism leads to complete loss of libido (sexual drive) and hyperthyroidism leads to impotence. In women, hypothyroidism causes menorrhagia and polymenorrhoea. In some women, it causes irregular menstruation and occasionally amenorrhoea. Hyperthyroidism in women leads to oligomenorrhoea and sometimes amenorrhoea
- **Action on other Endocrine glands:** Because of its metabolic effects, thyroxine increases the demand for secretion by other endocrine glands.

Physiological functions of Agni

Ayurveda has described an important factor of digestion and metabolism in our body as Agni. Ingested food is to be digested, absorbed and assimilated, which is unavoidable for the maintenance of life, and is performed by Agni. In Ayurveda, the term "Agni" is used in the sense of digestion of food and metabolic products. Agni converts food in the form of energy, which is responsible for all the vital functions of our body. Therefore, Ayurveda considers that Dehagni is the cause of life, complexion, strength, health, nourishment, lusture, oja, teja (energy) and prana (life energy)^[2]. About the importance of Agni, Acharya Charak has mentioned that after stoppage of the function of Agni, the individual dies, and when the Agni of an individual is balanced, then that person would be absolutely healthy and would lead a long, happy, healthy life. But, if the Agni of a person is vitiated, the whole metabolism in his body would be disturbed, resulting in ill health and disease. Hence, Agni is said to be the base (mool) of life^[3]. The metabolic action of agni is influenced by pitta, samana vata and kapha up to some extent and these are ultimately regulated by vata. Agni is having general and specific action in the body, so according to different functions and sites of action it is of 13 major types:

- Jatharagni – one Agni present in the stomach and duodenum.

- Bhutagni – five Agni from five basic elements.
- Dhatwagni – seven Agni present, one in each of the seven dhatus

Accordingly, they are classified into three groups, namely Jatharagni, Bhutagni and Dhatvagni.

Jatharagni: Jatharagni is the Agni or bioenergy present in the Jathara (stomach and duodenum). According to Ashtanga Hridaya, grahni is the seat of jatharagni and it withholds the food for a certain time inside the amasaya (stomach) to facilitate digestion. It is responsible for the duration of life, health, valour, ojas (essence of the dhatus), strength of all the bhutagni and dhatvagni. The strength of the grahani is from Agni itself, and the strength of Agni is from grahani. When the Agni undergoes vitiation, grahani also gets vitiated and produces diseases^[4].

Jatharagni is considered to be the most important because each and every nutrient that one ingests first comes to the Jathara and is subjected to the action of Jatharagni. So the basic function of Jatharagni is macro digestion of food particles. Jatharagni digests the food materials that consist of the five basic elements and transforms it for utilization by the respective dhatus paramanus (tissues). Jatharagni is also responsible for separation of the food material into the essence portion (Prasad) and the waste products (kitta) in our body^[5]. Jatharagni is directly related to Dhatvagni or bioenergy in the cells and their metabolic processes, with ultimate tissue metabolism or dhatu-paka process. All the Dhatvagni depend on the normal, healthy state of Jatharagni. If the Jatharagni is hyperactive (tikshna) or hypoactive (Manda), it will cause an excessive or retarded action of the dhatvagni. This disturbed action ultimately leads to various disorders. Jatharagni is the main important Agni that controls the function of all other 12 Agnis. All the Agnis are totally dependent on the status of Jatharagni^[6].

Bhutagni: Bhutagni is the one that is present in a basic element (Bhutas). There are five Agnis in each of the five basic elements, namely – Parthiva (earth), Apya (water), Tejas (Agni), Vayavya (vayu) and Nabhasa (akash). Each and every cell in our body is composed of the five mahabhutas or five basic elements. Naturally, each cell (dhatu paramanu) consists of these five Bhutagni also. All the nutrients in this world that we eat also consist of the same five basic elements with their respective Agni or bioenergy's. Thus, they are completely similar with respect to the five basic elements with their Bhutagni in our body cells as well in all outside nutrient that we ingest for the nutrition of our body. Acharya Charak has mentioned that the five Bhutagni digest their own part of the element present in the food materials. After the digestion of food by the Bhutagni, digested materials containing the elements and qualities similar to each bhutas nourish their own specific bhautika elements of the body^[7]. These Bhutagnis act after the Jatharagni present in the stomach and duodenum, acting on the food and causing their disintegration. Thus it causes micro- digestion. In the modern physiological perspective, the action of Jatharagni can be equated with the digestion in the stomach and duodenum, and the action of the Bhutagni can be equated with the conversion of digested materials in the liver.

Dhatwagni: All the seven Dhatus (seven element tissues of the body) contain their own Agni to metabolize the nutrient materials supplied to them through their own Srotas. The ssevendhatwagnis are Rasagni, Raktagni, Mamsagni, Medagni, Asthyagni, Majjagni & Shukragni. Each Dhatvagni or the bioenergy present in each Dhatu synthesizes and transforms the essential Rasa Dhatu required for that particular Dhatu or cell from the basic nutrients present in the AnnaRasa or essence of the diet that we consume. Each Dhatvagni has got a speciality to synthesize and transform the constituents suitable to its particular Dhatu. This action is a sort of selective action. Acharya Charaka has mentioned the fact that that the seven dhatus that are a support of the body contain their own Agni, and by their own Agni they digest and transform the materials supplied to them to make the substances alike to them for assimilation and nourishment^[8]. Explaining briefly the digestive and metabolic functions of agni, acharyacharaka has mentioned that various types of deictic materials are digested by their own Agni (Bhutagni), encouraged and enhanced by antaragni (Jatharagni), which is further digested and metabolized by dhatvagni to associate the body with the nutritional strength, complexion and happy life along with providing energy to the seven dhatus.

Framing functions of thyroid hormone according to agni

So the metabolic effect of thyroid hormone can be seen on almost all the cells of body. The effect of agni is also on each and every cell in the body. Just as thyroid hormones help in protein, carbohydrate and fat metabolism, jatharagni digests these substances into the guts and with the assistance of samanvayu it helps the absorption of these substances. Bhutagni converts these heterogeneous substances into homogeneous substances so that it can be utilised at the cellular level. And at last dhatwagni helps in the metabolism of these substances at the cellular level. The normal level of thyroid hormone helps in growth, development and maintenance of the body tissues in cvs&cns, maintains sound sleep and sexuelle function. Similarly normal level of agni in body is responsible for strength, sound health and longevity of life. The increase or decrease in the thyroid hormone disrupts body's metabolism and produces various diseases which can lead to either hyperthyroidism or hypothyroidism. Vitiated agni is said to be the root cause of all the diseases in the body. Decreased agni (mandagni) increases aam in the srotas (channales) of the body which leads to various diseases in the body. These vitiated agni causes vitiations in the doshas which leads to various diseases similar to hypothyroidism and hyperthyroidism. Symptoms of hypothyroidism resemble the symptoms produced by vata and kaph increment and symptoms of hyperthyroidism resembles symptom's produced by vata and pitta increment. The Srotas affected by thyroid hormone are mainly RasavahaSrotas, MamsavahaSrotas, Medovaha Srotas, Asthivaha Srotas, SukravahaSrotas. Vitiation of srotas also depends on agni.

Hypothyroidism and Hyperthyroidism from ayurvedic perspective

Hypothyroidism results from failure of thyroid gland to produce enough thyroid hormones to meet the metabolism of body or from resistance of peripheral tissue to thyroid

hormone. Hypothyroidism results in slowing of metabolic process and energy expenditure. It results in a multitude of clinical signs and symptoms which are similar to ayurvedic symptoms. The vata symptoms like fatigue, loss of energy, cold intolerance, dry skin, hair loss, muscle pain, joint pain, weakness in the extremities, mental impairment, forgetfulness, impaired memory, inability to concentrate, blurred vision, decreased hearing, constipation, menstrual disturbances, impaired fertility, decreased perspiration. The kapha symptoms like lethargy, sleepiness, weight gain, decreased appetite, cold intolerance, fullness in the throat, hoarseness, etc. are produced. These all symptoms are produced due to vata-kapha increment and decreased agni. Hyperthyroidism results from high production of thyroid hormone which causes increased metabolism and energy expenditure.

The conditions result in the symptoms of increased vata and pitta doshas. The vata symptoms include nervousness, anxiety, palpitations, rapid heartbeat, tremors, and bulging of eyeballs. Pitta symptoms include excessive hunger, heat intolerance, excessive sweating, high blood pressure, irritability and emotional disturbance, and menstrual changes. There will be an increase in the metabolic rate and weight loss, and the person will become easily fatigued. So these symptoms are due to increased pitta-vata. The gastro-intestinal symptoms of hyperthyroidism resemble the features of *atyagni* (intense digestive fire) mentioned by Charaka. At present juncture; we can say that, functions of *kayagni* (digestive fire) will be abnormal in both these conditions. The state of *kayagni* (digestive fire) is very important as far as remaining *bhutagni* (fire of five elements) & *dhatwagni* (fire of seven tissue elements) are concerned. It gives strength & nourishment to other agni in body. Further, the condition of *dhatwagni* in hyper & hypothyroidism can be explained. *Dhatwagnis* are considered as part of *kayagni* and are located in *Dhatu*. Increase of *dhatwagni* brings *Dhatu kshaya* (diminished tissue elements) & decreased *Dhatwagni* will lead to *Dhatu vriddhi* (increased tissue elements). In case of hyperthyroidism patient will lose weight. It is due to the increased *Dhatwagni* which cause *Dhatu kshaya*. In hypothyroidism, weight gain is due to decrease in *Dhatwagni*.

DISCUSSION

Though the exact terms of all the diseases of thyroid disorders are not described in Ayurveda, the signs and symptoms produced due to thyroid dysfunction is described in Ayurved under its classical terms. And pathophysiology of all those diseases lies in the concept of agni as agni is said to be the prana (life) of the living body. Vitiations of doshas also depends on vitiations of agni that is why for bringing doshas in balanced state, treatment of agni is done [9]. Hence in the diagnosis and treatment of any diseases maximum consideration is given to the preservation/protection of agni [10]. As body is made up of dosha (humors), dhatu (tissues) and mala (waste), nourishment of each of these solely depends on balance agni of each dhatu. Along with the macro function in the body micro function of the body like immunity, strength, luster, glow, also depends on agni. According to modern medicine, metabolic processes, division and multiplication are going on in all cells (dhatu paramanu) of our body from birth till death. The cell is the functional unit of the body.

According to Charak, the constituent parts of the body, if further divided into the atoms, are sure to become innumerable, as such cells or atoms are exceedingly numerous, very minute and ultrasensory. In the conjunction and disjunction of cells, the activating factors are Vata and agni [11]. In Shushruta, we can see how the "Avayavaas" are formed from "various dhatus" [12]. Thus, based on Charak and Shushruta, the above cells can be considered as "dhatu paramanus." For these constant processes in all cells, a biological energy is constantly essential, without which the survival of our body will be quite impossible. The same biological energy is provided by Agni in Ayurveda. Hence agni act in the same way as the thyroid hormone dose for body metabolism.

Conclusion

There is no exact correlation of thyroid gland in Ayurveda. But the Ayurvedic system of medicine doesn't emphasize on naming the disease. It rather insists on understanding the constitutional status of a disease and adopting an appropriate treatment principle. Hence Ayurveda always stress that if you won't find the name of particular disease in texts, in such a situation fit all the symptoms of that disease in its basic principles and then only treat as per Ayurvedic principles of treatment. So it can be concluded that by understanding thyroid disorder from ayurvedic perspective, can give safe and effective management and healthful longevity.

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