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Concept of Hypothyroidism in Ayurveda in the Era of Karya Karan Siddhanta – A Review

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ABSTRACT: In this paper concept of hypothyroidism in the classics have been compiled and discussed accordingly with the doctrine of Karya-Karana. For hypothyroidism, the inflammation of the gland or failed immune response towards the glands is the SamavayiKarana. Oxidative Injury is the Asamavayi Karana as it enhanced the disease. Conducted carrier parents are the Nimittaja Karana and production of primary hypothyroidism is Karya. The disease hypothyroidism may be compared with VataKaphajaSotha in the parlance of Ayurveda.

Key words: Karya-Karana Siddhanta, VataKaphajaShotha, Hypothyroidism.

I. INTRODUCTION

Primary Hypothyroidism is an intrinsic disorder of thyroid gland in which low level of thyroid hormones i.e. T_4 and high rise of TSH[1] occur. The disorder of thyroid gland is as old as the history of mankind. Nearly 220 million population of the world now are suffering from the thyroid disorders[2]. The prevalence of the disease is more in female than in male. The ratio in male and female is 1: 6[1]. In Himalaya region and some other countries as Central Africa, where the dietary iodine is less, and the person of those area are more prone to develop the diesease[2]. Among countries after Brazil, maximum numbers of thyroid disorders are reported from India[2]. Ayurveda, being a complete health science cannot keep itself aside without answering the newer and fast growing health problems. Ayurvedic classic has not been mentioned the term thyroid or hypothyroidism has not been mentioned. But similar concept of gland, their functional abnormality and remedies has been vividly described in the text.

The different bodily metabolism in terms of Agni has been described in different Ayurvedic classics; which is basically Usma of Pitta[3]. In other words, Agni is a substance which originates (Janya) from the Pitta (Janaka)[4]. Pachakagni is responsible for the nourishment of all the enzymes, co-enzymes, hormones and other chemical which are involved in the digestion, assimilation and heat production[5]. Agni is explained as Jatharagni, Dhatogni and Bhutagni at the different level of bodily metabolism[6]. Kshaya and Vriddhi of Dhatu occur according to sharpness or dullness part (Antra) of Packagni present in Dhatu, According to LaghuVagbhatta is concerned[5]. The main pathology occurs in hypothyroidism is hypo or less functioning of thyroid gland. Auto immunity against the thyroid and intrinsic disorder of the gland is responsible for less functioning of thyroid gland[1]. Improper metabolism of thyroglobulin is also responsible for the generation of the disease hypothyroidism. Firstly, most of the patients have inflammation of the thyroid gland or thyroiditis following progressive detoriation and ultimately fibrosis of the gland, resulting less or absence of secretion of thyroid gland[7].

The secretion and metabolism of the hormone in the body is decreased as a result of Mandagni and improper Dhatupak. This happens due to Agnimandya at the level of the gland and resulting in depletion of all its improper secretion and metabolism. MandagniDhatupak becomes improper, especially in Mamsadhatu and Medodhatu and abnormality of both are seen.

In Svayuthya vitiated Kapha, Rakta and Pitta (fibrosed intracellular components of thyroid gland) lodged into the UrdhaBahyaShira (Thyroid gland) obstructing the normal flow of Vayu (T_3, T_4 secretion). It leads to formation of VataKaphaja Svayathu[8], identical to the pathogenesis of Hypothyroidism.

II. MATERIALS & METHODS:

The ancient Ayurvedicliteratures were looked into in search of the concepts of Ayurvedichypothyroidism in Ayurveda and Karya-KaranSiddhanta. The online search engines i.e. Google search and Pubmed database and others were searched with the headings, hypothyroidism

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in Ayurveda, relation of Karya-Karan Siddhantaand others. The obtained information were collected and interpreted accordingly.

Karya Karan Siddhanta

Basically Ayurveda stands with different types of Siddhanta, among them 'Karya-Karana Siddhanta' is one of the most important Siddanta. Due to its acceptance by majority of the scholars in the field of philosophy directly or indirectly, it is generally considered as SarbatantraSiddhanta. But as per its specific applicability is concerned, it is again narrated as PratitantraSiddhanta. In Ayurveda main aim of this principle is to establish the underline relationship among Karya-yoni, Karya-phal, Anubandha, Upaya with Karyotpatti-desa-kala, etc.

According to process of Karyopatti, Karan is of three kinds, i.e. Samavayi (material/ inheritant/ constituents/ substantial), Asamavayi (non-intimate/ non-constituent) and Nimitta (instrumental/ efficient). Samavayi or intimate comes is that which is inseparable or inherent relation with which an effect is produced[9]. Asamavyi or Non-Intimate cause is that which is being intimately concerned either with an effect or with the intimate cause in the same object[9]. Instrumental cause is different from these above two[9]. It is considered as a special cause. A Karana is that which is in variably antecedent to the Karya. Karana must be Ananyathasiddha, it must not be Anyathadiddha. When the effect is capable of being produced by certain cause, which is invariably antecedent to it, other things that come there incidentally or in addition along with those cause are Anyathasiddha. The Samavayi Karana is Upadana Karana or Material cause out of which the Karya is made. That being in Samavaya relation produces the effect. Asamavayi Karana is admitted only by the Naiyayik as is order to connect the Karya and Karana which are regarded as distinct. The Asama Karana can only be a Guna or Kriya, it can not be a Dravya. In two aspects it is called Asamavayikarana. All cause other than the Samavayi and Asamavayi are classified as Nimitta Karan. Samavayi and Nimitta Karana correspond respectively to the material cause and the efficient cause of Aristotle. The primary motto of this science is DhatuSamyaKriya, whereas the means of doing the same is Samanyadi six elements. So in Karya Karana relationship both the RogaRupaKarya and DhatuSamyaRupaKarya is to be considered. So in the era of treatment, the homoeostasis of altered Dosa, Dhatu and Mala is the main aim. Here the imbalance state of Dosa, Dhatu and Mala is established due to some Karana and neutralizing factors like Ausadha, Ahara, etc., are also DravyaRupa Karana. In addition to that assessment of Karma (YatKurbanti), Virya (YeneKurvanti), Upaya (YathaKurbanti), Desa (YatraKurbanti) and Kala (YadaKurbanti) are not possible without KaryakaranaVada.

Embryogenesis of Thyroid Gland

Embryologically the thyroid gland is derived from the Matrija Bhava[10]. In the Pacchyaman stage, Kapha, Rakta and Mamsa form the earliest part of the pharyngeal derivatives[11], to make its appearances. The continued anatomical and functional development of the thyroid gland is depending upon the VayuMahabhuta during the formation of embryo[12] According to Bhoja the foetus get nourished from the placenta by the process of KedarikulyaNaya, but the placenta is impermeable to the maternal TSH, that is why the origin of the thyroid gland is necessarily fetal. The functional development of the thyroid has been studied in various aspects thyro-protein resembling thyroglobulin appears just before or at the time when follicular structure is first apparent[13]. In embryos towards the close of the 4th weeks a median diverticulum arises from the floor of the pharynges at a cephalo-caudal level between the first and second pouches. Almost all from its initial appearances this thyroid primordium is bi-lobed. It soon its connection with the floor of pharynx, but its point of origin tends to remain marked by a depression of variable conspicuousness known as the foramen mecum. By the early part of the 7th week it lies at about the level of laryngeal primordium and it reacts on the caudal face of the 4th pharyngeal pouches, there develops the small diverticulae. Some of the diverticulae forms the rudimentary 5th pharyngeal pouches and this small pouches joint with median thyroid primordium to form the thyroid tissue[14].

Pathogenesis

Due to aggravation of Vayu at the level of hypothalamus and at the level of thyroid gland, the thyroid hormone secretion will be increased and causes the Dhatukshaya in anterior pituitary, resulting the inhibition of secretion of TSH. Although, perhaps secondarily by much weaker effects acting through the hypothalamus[7]. The hypothalamus release a hormone called thyrotropin releasing hormone (TRH) which sends a signal to the pituitary to release thyroid hormone (TSH). In turn; TSH sends a signal to the thyroid to release

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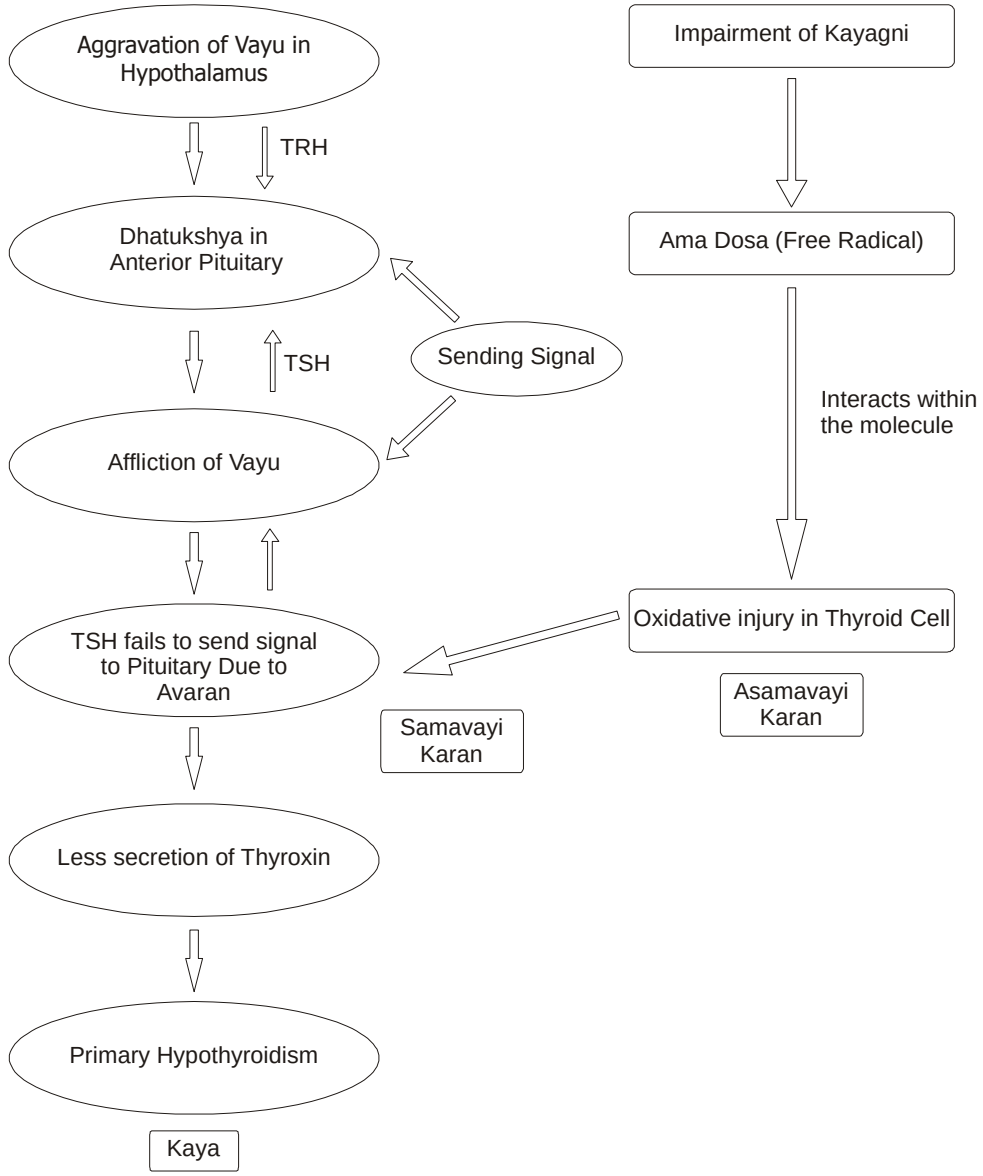
thyroid hormone. Perhaps this phenomenon is controlled by the action of Vayu located there. If the Vayu of these particular location gets occluded in the channels of signal path way; the TSH does not sends the signal to release thyroid hormone and produced the disease hypothyroidism on the other hand impairment of Kayagni produces the Amadosa (free radical) in the body at the same time; which is being interacting within the molecule of thyroid gland, resulting the oxidative injury produce in the thyroid cell. So, this way also there is failing of signal to TSH and pituitary and thereby produces the hypothyroidism[15].

Fig. 1: Pathogenesis of primary hypothyroidism



Symptoms

Fatigue	:	Alasya[5]
Decreased hear rate	:	Usnakamita[5]
Progressive hearing loss	:	Indriya Daurbalya[5]

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Goiter	:	Prapidita Sopha[8]
Dry skin	:	Khara-Parusa-BhinnaTwaka& Roma[8]
Constipation	:	Bibandha
Extreme sensitivity to cold	:	Saitya[5]
Hoarseness of voice	:	Kshamaswara[17]
Muscle pain or weakness	:	Daurbalya[5]

Causes

Hypothyroidism is most often the result of Hashimoto's disease, also known as chronic thyroiditis, i.e. inflammation of thyroid gland[18]. Due to intake of curd, uncooked food, Mrit (mud), Dusta Anna and Virodhi Anna, the immune system fails to recognize that the thyroid gland[8] is part of the body's own tissue and attacks it as if it were a foreign body. Also inappropriate administration of elimination therapies and improper care of the patient after the administration of these therapies, Ama[21] will produce in the body and it attack to the immune system, results, the impairment of thyroid function and some things destroy the gland[22].

Other causes

- **Radiation:** Radioactive iodine used to treat hypothyroidism (overactive thyroid) or radiation treatment for heat or neck cancers can destroy the thyroid gland[20].
- **Surgery:** Removal of the thyroid gland because of cancer or other thyroid disorders can result in hypothyroidism[20].
- **Virus & Bacteria:** Excessive intake of curds, Amla, Tiksna, Usna, Guru Ahara. The infection may occur and depressed thyroid hormone production usually causes permanent hypothyroidism[6].
- **Meditation:**Nitropruside, lithium, or iodides can induce hypothyroidism. Because who use these medications is closely monitored by their doctors, this side effect is very rare[14].
- **Pituitary gland malfunctioning:** This is a rare condition in which the pituitary gland fails to produce enough TSH to activate the thyroid's production of T_4.
- **Diet:** Because the thyroid makes T_4 from iodine drawn from food, an iodine-deficient diet can cause hypothyroidism. Adding iodine to table salt and other common foods has eliminated iodine deficiency contained foods i.e. Viruddha Anna and Saka (leafy vegetables) as cabbage, rutabagas, peanuts, peaches, soybeans, spinach can interfere with thyroid production[14].

Role of oxidative Injury

A normal attribute of aerobic life with structural damage of a member of compounds – DNA, proteins, carbohydrates, lipids – by oxidation the oxidative damage caused by reactive oxygen species is called oxidative injury. Thyroid hormones are associated with the oxidative and antioxidative status of the organism. To develop hypothyroidism; thyroidal cell are exposed to endogenous H_2O_2 that acts as a cofactor for the iodination of thyroxin precursors. The gland has high level of selenium – Containing proteins, including peroxide-detoxicating enzyme proteins. The selenium-containing proteins are involved in thyroid hormonal synthesis, by protecting biosynthetic processes against the toxicity of free oxygen radicals.

Thyroid hormones are among the most important humoral factors involved in setting the basal metabolic rate. It is well known that thyroid hormones increases mitochondrial respiration through changes in the number and activity of mitochondrial respiratory chain components providing a considerable impact on oxidative stress. Accordingly, it was reported that the thyroid state might alter the changes in oxidant and antioxidant system. High concentrations of thyroid hormones and thyrotoxicosis can facilitate the metabolism of oxygen in aerobic conditions, stimulate free radical generation and aggravate oxidant mediated tissue injury, on the other hand metabolic depression brought about by hypothyroidism has been associated with decreased oxidant production and protection against tissue lipid peroxidation. Hypothyroidism is associated with a decrease in free radical production and subsequent protection against oxidative damage. In contrary high conversion of thyroid hormones were shown to increase the metabolism of oxygen in aerobic conditions and stimulate free radical generation. Thus reduce demand for oxygen and concomitant suppression of free radical formation in hypothyroidism appears to serve as a protective factor in radiation induced oxidative injury[22].

Treatment

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Natural or Synthetic thyroid hormones are used to restore normal (euthyroid) thyroid hormone levels. Substances, but it may take several months to determine the correct dosage. Patients start to feel better within 48 hours, but symptoms will return if they stop taking the medicine. Most doctors prescribe levothyroxine sodium tablets, and most people with hypothyroidism will take the indication for the rest of their lives. Aging, other medications, and changes in weight and general health can affect how much replacement hormone a patient needs, and regular TSH tests are used to monitor hormone levels. Patients should not switch from one brand of thyroid hormone to another without a doctor's permission. Regular exercise and a high fiber diet can help maintain thyroid function and prevent constipation[18].

Alternative treatments are primarily aimed at strengthening the thyroid and with not eliminate the need for thyroid hormone medication's. Herbal remedies to improve thyroid formation and relieve symptoms of hypothyroidism include bladder wrack (Fucusvesiculosus), which can be taken in capsule form or as a tea. Some foods, including cabbage, peaches, radish, soyabeans, peanuts and spinach, can interfere with the production of thyroid hormones. Anyone with hypothyroidism may avoid these foods[19].

Ayurvedic treatment

Trikatu (Sunthi, Pippali, Marica), Trivrit and Katukarohini mixed with powder of Drona, to be taken with TriphalaKwatha (Amlaki, Haritak and Vibhitaki) and paste of Punarnava, Nagara and Mustak should taken with milk reduces the Vata - KaphajaSotha. Medicated paste of Ajagandha, Ativisa, Kushta, Visanika, etc., taken in equal part and pasted with the alkaline water prepared from the ashes of the Palasa wood should be applied hot in condition to the affected part[20].

III. DISCUSSION

Hypothyroidism may be referred to as a 'silent' disease because early symptoms may be so mild that no one realizes anything is wrong. Untreated symptoms become more noticeable and severe and can lead to confusion and mental disorders, breathing difficulties, heart problems, fluctuations in body temperature and death[23].

Thyroid gland is derived from the MatrijaBhava during embryogenesis. In the Pachyaman stage, Kapha, Rakta and Mamsa form the earliest part of the pharyngeal derivatives to make its appearance. The continued anatomical and functional development of the gland is depending upon the VayuMahabhuta during the formation of embryo. Due to aggravation of Vayu at level of thyroid gland the thyroid hormone secretion will be increased and causes the DhatuKshya in the anterior pituitary, resultingthe inhibition of secretion of TSH. Although, perhaps secondarily by much weaker effects acting through the hypothalamus.

On the other hands, body constantly reacts with oxygen in breathing and in terms of metabolism and cell produces Agni or energy. As a consequence of this activity, highly reactive molecules or Amadosa (Free radicals) are produced due to impairment of Kayagni. Free radicals interact with other molecule within cells. This can cause oxidative damage to protein, membranes and genes. Kayagni related to the factors concerned with the gastrointestinal digestion and its wider sense to metabolism events of the body. AmaDosa or free radicals are related with the metabolic disturbances engendered due to impairment of Antaragni or Agnidusti[21]. In vital organs, tissue injury caused by a range of insults, including oxidative stress can result in development of progressive fibrosis leading to ultimate organ failure. In case of thyroid same phenomena happens and thyroid tissue get fibrosed resulting less formation of thyroid hormone to produce primary hypothyroidism.

IV. CONCLUSION

In conclusion if may be concluded that in case of production of Vyadhi, Karya Yoni is related to Samarayi Karma. Hence, the inflammation of the gland or failed immune response towards the glands is the Samavayi Karana. Oxidative Injury is the Asamavayi Karana as it enhanced the disease. Conducted carrier parents are the Nimittaja Karana and production of primary hypothyroidism is Karya. It is also concluded that primary hypothyroidism may be compared with the VataKaphajaSotha as per as the era of modern and Ayurvedic textual analysis is concerned.

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