Hypothyroidism And Stress- A Review Article

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ABSTRACT: Due to modernization and increased stress in daily life, lifestyle has been changed which results into many endocrinal diseases, Hypothyroidism is one among them. Stress plays a major role in hypothyroidism pathogenesis. In Samhitas there is no direct reference of hypothyroidism but due to increased stress in our routine life it alters hypothalamus-pituitary-thyroid axis activity. In contemporary system of medicine, the drug of choice for Hypothyroidism is levothyroxine. Side effects of these drugs are increased hunger, muscle weakness, irregular periods, diarrhoea, excessive sweating, fever, hair loss, etc. In Ayurveda there is not any direct reference of chikitsa of hypothyroidism but it can be managed by using stress relieving and kapha vatahar chikitsa like shirodhara, abhyanga, various medhya rasyana. Laughter therapy and yoga also play a major role in reducing stress. This study was carried out using various ayurvedic classical text, pubmed, google scholar as well as available modern literature, collected data and observation were presented in a scientific manner. The review will be beneficial to understand the pathogenesis of hypothyroidism and modify the line of treatment of disease.

Keywords:- Hypothyroidism, Agni, Shodhan, Shaman, Stress
INTRODUCTION:

Metabolic process of our body is controlled by thyroid hormones. Due to any resistance or lack of hormones to our body tissue with respect to metabolic demand it will lead to hypothyroidism. Hypothyroidism represent wide clinical spectrum ranging from an asymptomatic or subclinical condition with normal levels of thyroxine and triiodothyronine and mildly elevated levels of serum TSH to an overt case of myxedema, end-organ effects and multi system failure. Our brain maintains the thyroid hormone levels in the body through a finely controlled feedback mechanism involving the hypothalamus and the pituitary gland. According to a projection from various studies on thyroid disease, in India 42 million people are suffering from thyroid disorders, out of which hypothyroidism is most common with prevalence of 5.4%. It is more prevalent among the females with male female ratio being 1:6. Prevalence of hypothyroidism in India is high which affects one in 10 people, a study depicted that prevalence of hypothyroidism was the highest in the age-group of 46 to 54 years (13.11%) and the lowest in that of 18 to 35 years (7.53%). Stress affects the immune system both directly and indirectly through the activation of neural and endocrine systems. The phenotypic expression of AITD is to a large extent dependent on the balance of Th1 versus Th2 immune response. During period of stress an increase in secretion of glucocorticoids and catecholamines cause a selective suppression of Th1 response and a shift toward Th2 mediated humoral immunity. This mechanism may promote
development of Graves” disease. On the other hand a hypoactive hypothalamic-pituitary-adrenal axis may lead to a predominantly Th1 mediated immune activity which may promote thyroid cell destruction and Hashimoto’s thyroiditis through apoptotic pathway on thyroid follicular cells.

There is no direct reference of hypothyroidism in Ayurveda, but the symptoms can be corerlated to symptoms of Mandagnijanya vikara and Bahudoshavastha in general. Mandagni lakshana like Gatrasadnam (weakness of body), Adhmanam (distension of abdomen), Gourav (feeling of heaviness), and many symptoms of bahudoshavastha like Avsada (depression), klama (fatigue), sthaulya (obesity), Alasya (malaise), Daurbalya (weakness), Avipaka (indigestion) can be compared with symptoms of Hypothyroidism.

AIMS AND OBJECTIVES
To evaluate the role of stress as a etiological factor in pathophysiology of hypothyroidism.

Effect of stress on thyroid hormone
Hypothalamic-pituitary-thyroid axis and thyroid hormones

Stress alters the hypothalamic-pituitary-thyroid (HPT) axis function. Although the daily rhythm of TSH production is preserved in stress, the secretion of pituitary TSH is suppressed and TSH response to thyrotropin-releasing hormone (TRH) is blunted. The conversion of the relatively inactive thyroxine to the biologically active triiodothyronine in peripheral tissues is decreased during stress. On the other hand, the HPT axis has a close bidirectional relationship with the HPA axis and the sympathoadrenal system. TRH-induced TSH secretion is inhibited by glucocorticoids and catecholamines may enhance selected responses to triiodothyronine. Conversely, thyroid hormones enhance the actions of glucocorticoids and adrenergic effects. Once the normal relationship between these endocrine axis is disturbed, thyrotoxicosis can induce a vicious circle. Thyroid hormones can directly cause immune alterations. T-lymphocyte proliferative responses to mitogens are decreased and primary humoral immune responses are depressed in hypothyroid animals.

Pathophysiology of hypothyroidism

T3 and T4 are the two major hormone secreted by thyroid gland which effect on
our metabolic system. Thyroid hormone also promotes growth as amino acid uptake by tissues and enzymatic system involved in protein synthesis thus promoting bone growth. Thyroid hormone regulates carbohydrate metabolism as it stimulate glucose uptake, gluconeogenesis, glycogenolysis. Rasavaha Strotas exhibit similar function as it supplies nutrition energy to all body tissue. The thyroid hormone helps in fat metabolism by mobilizing lipid from adipose tissue and accelerate oxidation lipid energy. Lipid metabolism is similar with function of Medovaha strotas. Thyroid hormone increase basal metabolic rate (BMR) in all tissues except brain, spleen and gonads. This action can compared with function of Agni in our body. Rasavaha, Raktavaha, Mansavaha, Medovaha, Asthivaha, Sukravaha and Manovaha strotas are the main strotas affected by thyroid hormone.
Samprapti of hypothyroidism

Image 1: Pathophysiology of hypothyroidism and stress
Clinical presentation of hypothyroidism according to dosha

Vata Vruddhi\(^{19}\): Vata Vruddhi Lakshanas are Karshnya, Ushna Kamatwa, Aanaha, Shakrut graha, Bala Bhramsha, Indriya Bhramsha and Bhrama. Vata Vruddhi is due to increase in Ruksha and Sheeta Guna of Vata.

Kapha Vruddhi\(^{20}\): Kapha Vruddhi Lakshanas are Agni sadana, Aalasya, Gauravam, Shvaityam, Shaityam, Swasa, Kasa and Atinidrata. Kaphavruddhi is due to increase of Manda,Guru and Sthira guna of Kapha.

Pitta Kshaya\(^{21}\): Pitta Kshaya Lakshanas are Agnimandyam, Sheetam and Prabha Hani. Pitta Kshaya is due to the Kshaya of Ushna and Tikshna Guna of Pitta. Hence in hypothyroidism there is Vata Kapha Vruddhi and Pitta Kshaya

**SAMPRAPTI GHATAKA:**

1. **Dosha:** Kapha Vriddhi associated with Pitta Dushti and Margavaranajanya Vata Vriddhi

2. **Dushya:** Rasa, Meda predominantly

3. **Agni:** Jatharagni, Dhatvagni

4. **Ama:** Jatharagni mandya Janita, Dhatvagni mandya Janita

5. **Strotas:** Rasavaha Strotas, Medovaha Strotas predominantly

6. **Strotodusti:** Sanga, Vimarga gamana

7. **Adhisthana:** Galpradesha (Thyroid Gland)

8. **Udbhavasthana:** Amashaya

9. **Rogamarga:** Bahya Rogmarg

10. **Vyaktisthana:** Sharira
Symptoms of hypothyroidism according to *strota* involved

<table>
<thead>
<tr>
<th>Sign/symptoms</th>
<th><em>strota</em> involved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fatigue, Loss of energy, Dry skin, Lethargy, Sleepiness, Weight gain, Coarse facial features, Periorbital Puffiness, Macroglossia</td>
<td><em>Rasvaha strotas</em></td>
</tr>
<tr>
<td>Hair loss, coarse, Brittle, straw-like hair, loss of scalp hair, axillary hair, pubic hair</td>
<td><em>Asthivaha strotas</em></td>
</tr>
<tr>
<td>Dull facial Expression, depression, emotional liability, Mental impairment, forgetfulness, impaired memory, inability to concentrate</td>
<td><em>Manovaha strotas</em></td>
</tr>
<tr>
<td>Fullness in the throat, Hoarseness</td>
<td><em>Pranavaha strotas</em></td>
</tr>
<tr>
<td>Decreased Perspiration</td>
<td><em>Medovaha strotas</em></td>
</tr>
<tr>
<td>Menstrual Disturbance, Impaired fertility</td>
<td><em>Artavahā, shukravahā</em></td>
</tr>
<tr>
<td>Constipation</td>
<td><em>Purishavahā</em></td>
</tr>
<tr>
<td>Blurred vision, Decreased hearing</td>
<td><em>Indriya</em></td>
</tr>
<tr>
<td>Bradycardia, Decreased systolic blood pressure and increased diastolic blood pressure, Pericardial effusion, abdominal distention, ascites (uncommon), Non Pitting edema (myxedema), Pitting edema of lower extremities, Jaundice, Pallor</td>
<td><em>Rasavahā, Raktavahā</em></td>
</tr>
</tbody>
</table>
Lacuna of modern medicine
The drug of choice for Hypothyroidism is levothyroxine. It is associated with many adverse effects due to consumption for longer period. some of them are increased hunger, muscle weakness, irregular periods, diarrhea, excessive sweating, fever, hair loss, etc. Severe side effects are chronic heart failures, inflammation of skin caused by an allergy, mood changes etc. Even after regular intake also quality of life of the patient is not much improved, though laboratory investigations appear to be normal. So world is looking towards Ayurveda for a safe and effective medication for treatment of Hypothyroidism.

Treatment of hypothyroidism in Ayurveda
In Ayurveda there is not any direct reference of chikitsa of hypothyroidism but when we follow Samprapti vighatana Chikitsa, there is involvement of mansika nidan due to which there is vata prakopa and it cause jatharagni mandya which further cause dhatvagnimandya and uttaroutar dhatu dhusti. It depicts features of Kaphavrita Samana Vata Dosha, dhatvagni mandya and Bahudoshavasta. In

treatment of hypothyroidism nidan parivarjan chikitsa plays a major role, shirodhara, abhyanga, various medhya rasayana are one among them.

As stress play a major role in pathology of hypothyroidism, management of stress and proper councelling of patient is essential for treatment of hypothyroidism. It can be done with pharmacological and non-pharmacological therapies.

Pharmacological Management

1. Shirodhara:- Shirodhara has anti-anxiety, antihypertensive and sleep inducing effects. Physiological responses of shirodhara procedure reduces the sympathetic tone thereby decreasing the cardiac activity and increasing alpha and theta wave activity in brain, which may causes a relaxing effect upon the recipient terminating into the induction of sleep during the treatment session. Shirodhara are found to be equated with meditative state and a reduction in catecholamine and an increased serotonin reuptake is proposed as one mechanism of its action. Shirodhara can be added
to existing anxiety management protocol with reduced dependency and reduced adversity but with added efficacy of the integrated protocol.

2 **Abhyanga** : Abhyanga massage is promising in reducing subjective stress experience. It may be beneficial in lowering HR in all, and BP in prehypertensive subjects.\(^{24}\)

3 **Brahmi** : Centella asiatica has potential action in the regulation of hypothalamic-pituitary-adenocortical axis specially during stress related disorders. Brahmi is rich in antioxidants which are compound that terminate the attacks of free radicals and reduce the risk of degenerative disease\(^{25}\). It is also used as a memory enhancing, strength promoting, immune boaster, anti anxiety and antistress compound.

4 **Shankhpushpi** : It exhibits Nootropic effect ie it improves cognitive function, particularly executive functions, memory, creativity, or motivation, in healthy individuals.

5 **Ashwagandha** : It is anti-stress, anxiolytic, adaptogenic\(^{26}\), anti-inflammatory, cognition enhancing, Vatahara and Rasayana properties. The drug not only has a generalized effect on the disease but also has asymptomatic effect upon various symptoms like, anaemia, fatigue, swelling etc. Ashwagandha significantly restored the stress-induced alterations in plasma cortisol, blood glucose, and triglyceride levels.

**Non pharmacological Management**

**Laughter Therapy** : Laughter therapy is defined as a new kind of therapy that involves giggling, chuckling and a great sense of humor. Laughter therapy decreases stress hormones that constrict blood vessels and suppress immune activity and reduces at least four of neuroendocrine hormones associated with stress response\(^{27}\). Laughter helps to relieve the stress because while laugh adrenaline level goes down and also triggers the release of endorphins, the body’s natural painkillers and produce a general sense of well being. Laughter therapy also reduces blood pressure, reduce stress hormones, increase muscle flexion and boost immunes.
**Yoga** :- It is observed that yoga improves attention and emotional control as well as affects the nervous system, making the parasympathetic nervous system more dominant and stabilizing the autonomic nervous system to enhance resistance to the effect of stress. Yoga practices including asana, slow breathing, meditation, increases activation of P.N.S. & leads to mental relaxation. *Sukhasana, Balasana, Paschimottanasana, uttanasana* are some asana which can relieve stress.

**Pranayam** :- Breathing exercises can relieve stress and fatigue and improve respiratory function. Practice of *Pranayama*, Yoga and meditation controls the limbic hypothalamus axis. This reduces the anxiety and reduces the high level of stress hormones present in the blood. It also increases the level of beneficial hormones like adrenaline and encephalin. These two hormones have positive effect on our body and strengthen the immunity system. *Nadi shodhana pranayama* induces calmness and tranquillity. *Brahmari, Bhashrika* and *Kapalbhati* are recommended for stress management

**Stress Management Counselling** :- Talking is a tried and tested method of overcoming stress, anxiety or depression. It offers patients an outlet for any negative thoughts or feelings which can reduce stress as well as their mental well being, with the help of counsellor patient are able to better understanding themselves and find solution of their problem

**CONCLUSION**

From this review we can conclude that stress plays a major role as a etiological factor in pathophysiology of hypothyroidism. By using *Chikitsa Sidhant* of *nidan parivarjan*, stress relieving management or *medhya rasayan* can be used in management of hypothyroidism, so that patients can avoid the dependency on allopathic medicine.

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