

**HATHA-YOGA: A NOVEL APPROACH TO THYROID DISORDER***¹Dr. Poornima Jalawadi, ²Dr. Nivil V. Joseph and ³Anand Sultanpure¹Asst. Prof., Dept. of PG Studies in Shalyatantra, JSSAMC, Mysuru.²Asst. Prof., Dept. of PG Studies in Roga Nidaana, JSSAMC, Mysuru.³B.E. (Biotechnology).***Corresponding Author: Dr. Poornima Jalawadi**

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Article Received on 09/11/2018

Article Revised on 29/11/2018

Article Accepted on 19/12/2018

ABSTRACT

Thyroid disorders create a state of induced stress in the body as a result of which the person exhibit symptoms such as weight gain (or loss), anxiety, nervousness, irritability, mood swings, irregular menses etc. Generally, all these can be attributed to imbalance in thyroid hormones. But on other hand, we also know that there are several other chemical entities in our body such as Cortisol, Adrenaline, Catecholamines, Insulin, Vasopressin etc which are directly or indirectly responsible for these set of symptoms. These biochemicals are intricately linked to one another. Our body's responses to various situations can be explained in terms of how these biochemicals affect us at cellular level. Hatha-Yoga is known to have cause the reduction in intensity of several of above mentioned symptoms. Recent advancements in the field of epigenetics have changed the way how we look at the diseases caused due to genetic factors. Possible explanation is suggested in this article and it is proposed that there may be a chance to discover a novel approach in treating the thyroid disorders as per the traditional knowledge of ayurveda. A well designed study is needed to establish if the practice of Hatha-Yoga can have any beneficial effect on those individuals who are at high risk due to genetic predisposition or the patients diagnosed with Thyroid Disorders.

KEYWORDS: Cortisol, Adrenaline, Catecholamines, Insulin, Vasopressin.**Thyroid Disorder**

Thyroid is an endocrine gland which is responsible for the regulation of body's metabolism and growth. Triiodothyronine (T3) and Thyroxine (T4) are the two hormones it produces which plays a vital role in our body. Thyroid disorders directly affect the physiological processes like thermoregulation, basal metabolic rate, bone elongation, neural maturation etc., biochemical process like effective conversion of food into energy, protein synthesis etc., & even psychological conditions like mood.^[1]

Patients with thyroid disorders show abnormal levels of thyroid hormones. Detection is often late due to the slow progression of condition. Predominant symptoms such as stress, nervousness, anxiety, irritability, mood swings, persistent tiredness, weakness, palpitations, weight gain or weight loss, irregular menses, slow movements and thoughts, reduced reflexes are often misdiagnosed. Women are more prone to thyroid disorders than men.^[2] Type-1 Diabetes & Pregnancy increases the risk.^[3]

Hyperthyroidism is the condition where too much of thyroid hormones are produced by the gland. Underactive thyroid doesn't produce enough hormones and hence it is termed as Hypothyroidism.

Genetics

Whether it Hyperthyroidism or Hypothyroidism, the Autoimmune Thyroid Disorder (AITD) patients share some common etiological factors and genetic studies have revealed that if certain genes are unique for either conditions, others are common to both disorders.^[4] With the completion of human genome mapping project we now know that there are around 20,000 genes expressed in our cells. Some 250 of these are more expressed in cells of normal thyroid gland with about 20 genes (including genes for thyroglobulin, phosphodiesterase 8B, iodothyronine deiodinase 1, F-actin-capping protein sub unit beta, TSH receptor etc.)^[5] being highly thyroid specific. The protein synthesised by these genes are crucial constituents for structures and function of thyroid hormones.

The genes known to influence thyroid function have also been shown to affect various physiological and biochemical processes, and hence appearing of the listed symptoms.

Heritability studies^[6] have shown that more than 60% of circulating thyroid hormones and thyroid stimulating hormone concentrations are genetically determined.^[7] It is widely known and accepted fact that the majority of thyroid disorders are due to genetic causes.

But genes alone are not sufficient to pin point the cause. Rather it is the expression of the genes which needs to be looked at. It has been recognised for some time by the advances in the field of biotechnology that the genetic expression is influenced by the environment. This has led to a greater knowledge of the intricacies of genetic factors along with environmental factors that lead to diseases.

Epigenetics

The prefix “epi-” has its Greek origin which translates as “outside of, around, over”. This term was introduced by Conrad Waddington nearly eight decades ago.^[8] He defined it as “the branch of biology which studies the causal interactions between genes and their products which bring the phenotype into being”^[9] Epigenetics is the study of changes in organisms caused by modifications of gene expression rather than alteration of the genetic code itself.

Mere presence of certain genes does not necessarily causes the disease condition to develop. Environmental factors are equally crucial to ‘trigger’ the gene expression in a way which manifests as disease. Gene expression is influenced by epigenetic mechanisms.^[10] The cell epigenome exhibits dynamic nature which enables it to respond to a way so that it can best adapt to the environment. The epigenetic modifications can also be reversible.^[10] Various studies have demonstrated that epigenetic mechanisms play a crucial role and hence regulate gene expressions in different models and in various levels in conditions like Cancer, Autoimmune Diseases, Neurodegenerative & Psychological Disorders and even in Addiction cases of Substance Dependency.^[11]

Studies show that an epigenetic phenomenon known as X Chromosome Inactivation (XCI) is skewed in female genome which renders them highly susceptible to AITD.^[12]

At cellular level, the AITD symptoms manifest due to the activity of stress hormones viz. Cortisol & Catecholamine. The Hypothalamic-Pituitary-Adrenal Axis is triggered as a response to stressor (physical or psychological demand) leading to a cascade of physiological, behavioural, and psychological effects primarily as a result of release of cortisol and/or adrenaline, dopamine, norepinephrine etc.^{[13][14]} Constant state of hyper vigilance (or the classical “fight or flight” response) resulting from repeated firing of the HPA axis can lead to degeneration of the system which over a period of time leads to conditions such as Obesity, Depression, Anxiety, Nervousness, Irritability, Mood Swings, Substance Abuse etc.^{[14][15][16]}

Epigenetics have been considered to exert key roles in integrating those genetic and environmental factors and epigenetic modifications caused by environmental

factors may drive genetically susceptible individuals to develop thyroid disease.^[17]

Hatha-Yoga

The term *Hatha* comprises of two root words – *Ha* meaning *Prana* or the ‘Vital Forces’ and *Tha* symbolizing the mind or the ‘mental energy’. *Yog*, in Sanskrit, means ‘joining’. Ancient texts describe that the union of pranic & mental forces leads to great events in the human body.^[18] The “*Hatha-Yoga Pradipika*”, which was compiled in the 15th century by *Svatmarama*, defines it as a form of yoga where there is a gross body control of *Chittavritti*.

The 3000 year old system of holistic medical science is now considered as a form of Complementary and Alternative Medicine by the National Institutes of Health.^[19] Yoga enables an individual to deal with a typical flight-or-fight response in a completely opposite physiological & psychological state. Stress management is integral part of *Hatha-Yoga* practice. It is interesting to see the effect even at cellular levels. Experimental findings support that yoga can effectively decrease serum cortisol levels.^[20] Continuous practice helps achieve tranquillity of the mind by creating a sense of well-being, increased attentiveness, lowered irritability, feelings of relaxation.^[21]

Hatha-Yoga inhibits sympathetic area of hypothalamus which in turn lowers the effect of Adrenaline & Norepinephrine thereby optimizing body’s sympathetic responses to stressful situations and restores autonomic regulatory reflex mechanisms associated with stress.^[19] As a non-pharmacological form of treatment, hatha-yoga can be an alternative option for the treatment of mood disorders.^[19]

Novel Approach

Ayurveda explains the manifestation of disease with an example of a seed remaining dormant in the soil until favourable conditions are met.^[22] *Nidaana* leads to *dosha*, *dushya* vitiation in turn leading to disease manifestation. Thyroid Disorders can manifest physically and psychologically. *Panchakarma* therapy is well suited for physical manifestation while *Hatha-Yoga* (along with *Panchakarma*) can be a good remedy for the mental manifestation.

This is very much similar to the modern epigenetic understanding of development of Thyroid Disorders.

Though the epigenetic factors are being revealed with advancement of science, many aspects are yet to be completely uncovered. Studies are needed on the susceptible individuals to establish if the *Hatha-Yoga* practice can lower the significant markers associated with onset and/or development of Thyroid Disorders. *Hatha-Yoga* practice can be as good as any epigenetic intervention during the disease pathogenesis. Since the modern medicine is focused on symptom-management

approach, the traditional medical knowledge of Ayurveda could provide a much more holistic approach in minimizing the manifestation of Thyroid Disorders

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