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Hypothyroidism And Stress- A Review Article

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ABSTRACT: Due to modernization and increased stress in daily life, life style have 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 plays a major role in reducing stress. This study was carried out using through 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

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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%.[1] It is more prevalent among the females with male female ratio being 1:6.[2] Prevelence 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%)[3]

Stress affects the immune system both directly and indirectly through the activation of neural and endocrine systems[4]. The phenotypic expression of AITD is to a large extent dependedent on the balance of Th1 versus Th2 immune response[5]. 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[6].this mechanism may promote

development of Graves" disease . On the other hand a hypoactive hypothalamic-pituitary-aderanal axis may lead to a predominantly Th1 mediated immune activity[7] which may promote thyroid cell destruction and Hashimoto's thyroiditis through apoptoic pathway on thyroid follicular cells.

There is no direct reference of hypothyroidism in *Ayurveda*, but the symptoms can be corerelated to symtoms of *Mandagnijanya vikara* and *Bahudoshaavastha* in general. *Mandagni* lakshana like *Gatrasadnam*(weakness of body)[8], *Adhmanam*(distension of abdomen*), Gourav* (feeling of heaviness)[9], and many symptoms of *bahudoshavastha* like *Avsada*(depression), *klama* (fatigue), *sthaulya* (obesity*), Alasya*(malaise), *Daurbalya* (weakness), *Avipaka*(indigestion)[10] 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 [11]. On the other hand, the HPT axis has a close bidirectional relationship with the HPA axis and the sympathoadrenal system [12,13,14]. TRH-induced TSH secretion is inhibited by glucocoricoids and catecholamines may enhance selected responses to triiodothyronine. Conversely, thyroid hormones enhance the actions of glucocorticoids and adrenergic effects[13,14]. 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[15] and primary humoral immune responses are depressed in hypothyroid animals[16].

Pathophysiology of hypothyroidism[17]

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.

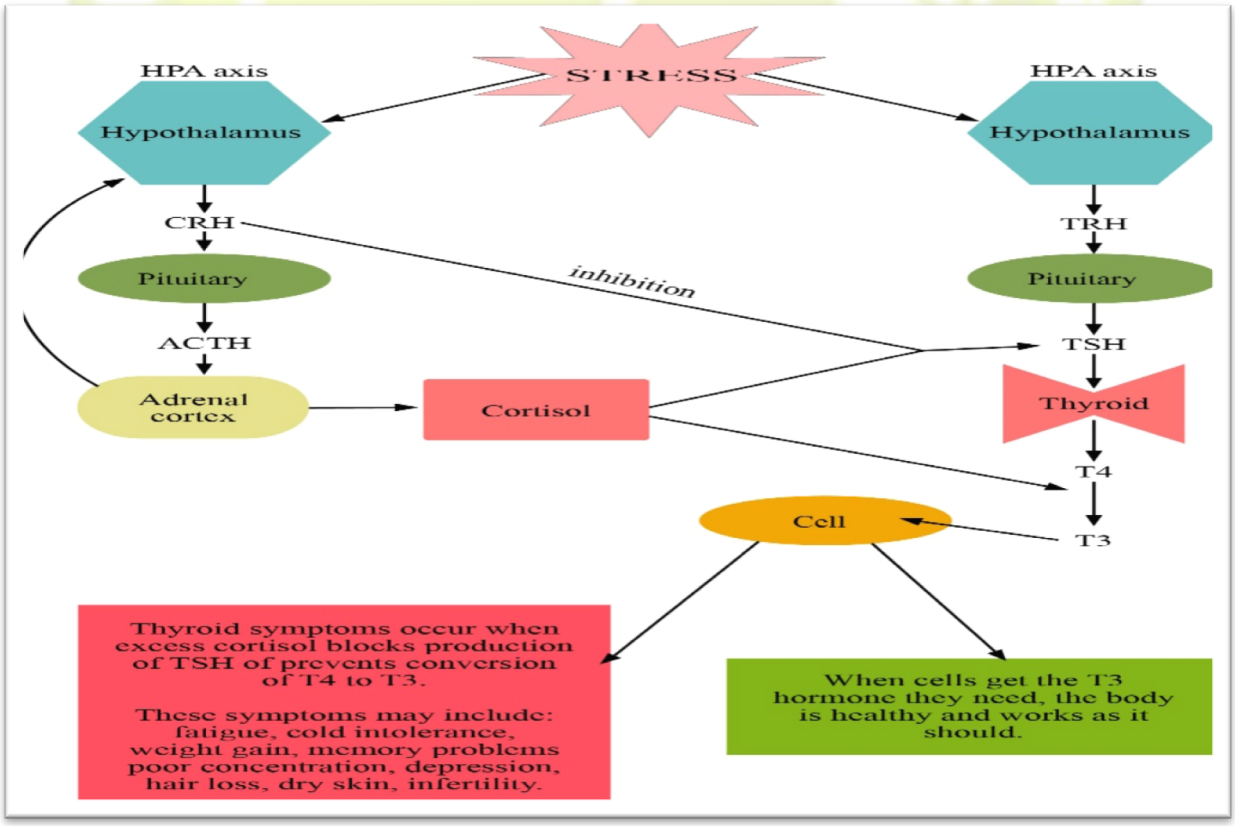
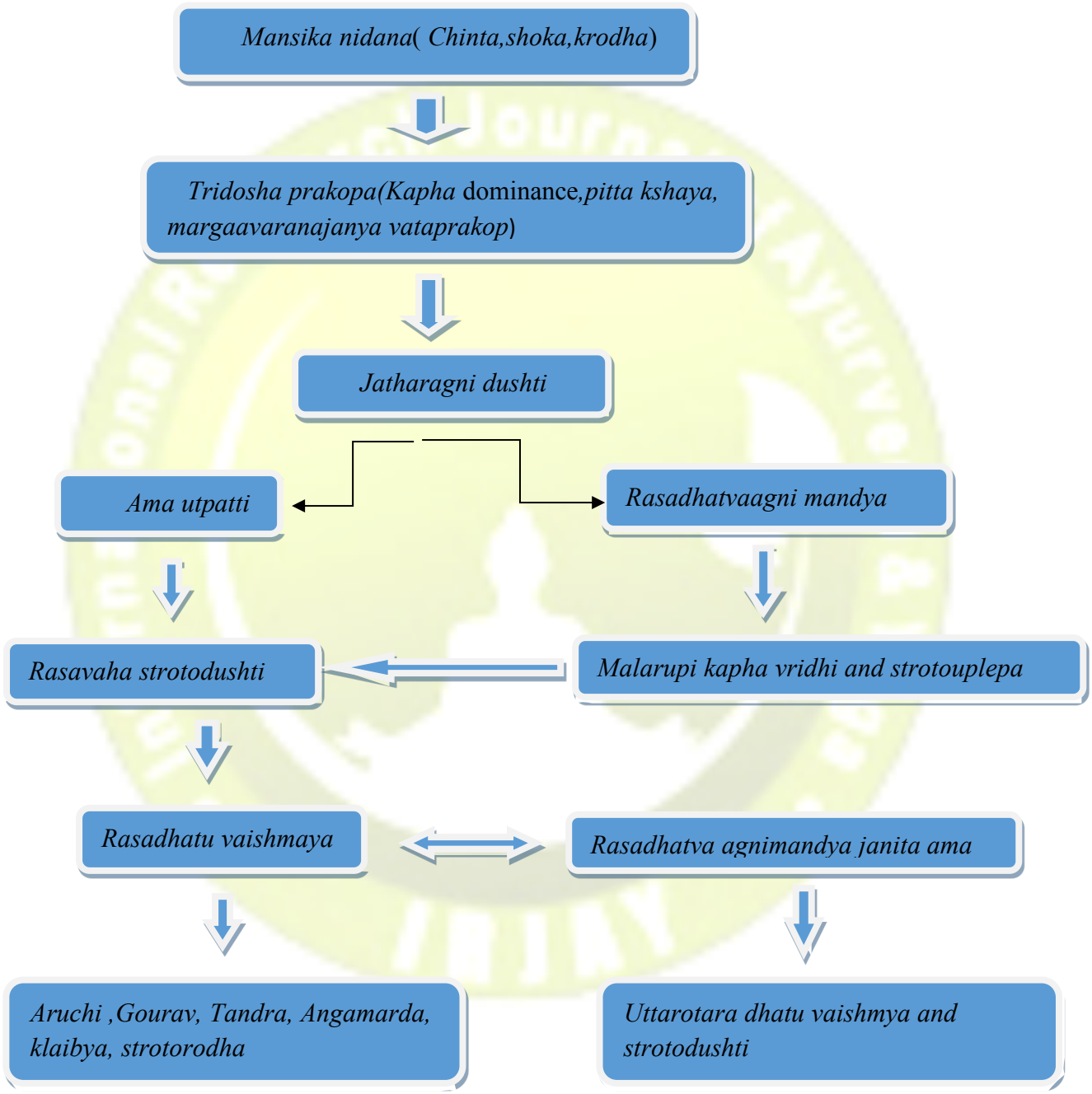


Image 1: Pathophysiology of hypothyroidism and stress

***Samprapti* of hypothyroidism**



***SAMPRAPTI GHATAKA*:**

1. *Dosha:-Kapha Vriddhi* associated with *Pitta Dushti* and *Margavaranajanya VataVriddhi*
2. *Dushya:- Rasa,Meda* predominantly
3. *Agni:- Jatharagni, Dhatvagni*
4. *Ama*:- *Jatharagni mandyaJanita*, *Dhatvagni mandyaJanita*
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*

Clinical presentation of hypothyroidism according to *dosha*

Vata Vruddh*[19] :-Vata Vruddhi Lakshanas* are *Karshnya, Ushna Kamatwa, Aanaha, Shakrut graha, Bala Bhramsha, Indriya Bhramsha* and *Bhrama. VataVruddhi* 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*

Symptoms of hypothyroidism according to *strotas* involved

Sign/symptoms	*strotas* involved
Fatigue, Loss of energy, Dry skin, Lethargy, Sleepiness, Weight gain, Coarse facial features,Periorbital Puffiness, Macroglossia	*Rasvaha strotas*
Hair loss, coarse, Brittle, straw-like hair, loss of scalp hair, axillary hair, pubic hair	*Asthivaha strotas*
Dull facial Expression, depression, emotional liability,Mental impairment , forgetfulness, impaired memory, inability to concentrate	*Manovaha strotas*
Fullness in the throat , Hoarseness	*Pranavaha strotas*
Decreased Perspiration	*Medovaha strotas*
Menstrual Disturbance, Impaired fertility	*Artavavaha, shukravaha*
Constipation	*Purishavaha*
Blurred vision, Decreased hearing	*Indriya*
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	*Rasavaha, Raktavaha*

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[22].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[23].*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 hypothalamo pituitary-adenocorticol 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[28]. *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.eg *Nadi shodhana pranayama* induces calmness and tranquillity. *Brahmari, Bhastrika* 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 councellor 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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REFERENCES

1. . Mudur, G. (1999, January 23). Endocrine disorders remain undetected and untreated in India. Retrieved August 30, 2020, from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1114720/
2. Cáp J. Hypothyroidism substitution and adrenal insufficiency in diabetic patients. Vnitrni lekarstvi. 2009 Apr;55(4):371.
3. .http://www.japi.org/thyroid_special_jan_issue_2011/article_01.html assess on 12-09-15
4. Chrousos GP. Stressors, stress, and neuroendocrine integration of the adaptive response: The 1997 Hans Selye Memorial Lecture. Annals of the New York Academy of Sciences. 1998 Jun;851(1):311-35.
5. Weetman AP. Cellular immune responses in autoimmune thyroid disease. Clinical endocrinology. 2004 Oct;61(4):405-13.
6. . Chrousos GP, Elenkov IJ. Interactions of the endocrine and immune systems. Endocrinology. 4th ed. Philadelphia: Saunders. 2001:571-86.
7. Wilder, R.L., 1995. Neuroendocrine-immune system interactions and autoimmunity. Annu. Rev. Immunol. 13, 307—338
8. Kaviraja Ambikadutta Shastri,.Susrutasamhita of Maharshi Sushruta, Edited with Ayurveda-Tattva-Sandipika Published by Chaukhambha Sanskrit sansthan, Varanasi,edition reprint,2010,part-1,Sutra Sthana,Aturupakramaniya adhyaya 35/29,page no.172.
9. Dr.Brahmanada tripathi, Astangahrdyam of srimad vagbhata, edited with Nirmala hindi commentary by Chaukhamba Sanskrit pratisthan,Delhi,edition reprinted 2014, ShariraSthana, Angavibhagashariraadhyaya ,3/76,page no-380.
10. Commentry by Pt. Kashinath Shastri and Dr. Gorakhanath Chaturvedi;Agnivesha, Charak Samhita. Sutrasthana. Varanasi: Chaukhamba Bharti Academy; 1998. Vidyotini Hindi 16/13-16 page no 320-321
11. Cremaschi GA, Gorelik G, Klecha AJ, Lysionek AE, Genaro AM. Chronic stress influences the immune system through the thyroid axis. Life Sciences. 2000 Nov 17;67(26):3171-9.

12. . Silva JE 2000 Catecholamines and the sympathoadrenal system in thyrotoxicosis. In: Braverman LE, Utiger RD (eds),Werner and Ingbar's The Thyroid: A Clinical and Funda-mental Text, 8thed. Lippincott Williams & Wilkins, Phila-delphia, pp. 642–651.
13. . Dluby RG 2000 The adrenal cortex in thyrotoxicosis. In:Braverman LE, Utiger RD (Eds), Werner and Ingbar's TheThyroid: 8th ed. Lippincott Williams & Wilkins, Philadelphia, pp. 637–641
14. Kamilaris TC, DeBold CR, Johnson EO, Mamalaki E, List-wak SJ, Calogero AE, Kalogeras KT, Gold PW, Orth DN 1991Effects of short and long duration hypothyroidism and hy-perthyroidism on the plasma adreno corticotropin and corticosterone responses to ovine corticotropin-releasing hor-mone in rats. Endocrinology 128:2567–2576.
15. Silberman DM, Wald M, Genaro AM 2002 Effects of chronic mild stress on lymphocyte proliferative response. Participation of serum thyroid hormones and corticosterone. Int Immunopharmacol 2:487–497.
16. Dorshkind K, Horseman ND 2000 The roles of prolactin,growth hormone, insulin-like growth factor-I, and thyroid hormones in lymphocyte development and function: In-sights from genetic models of hormone and hormone receptor deficiency. Endocr Rev 21:292–312
17. Bansode NM. "Hypothyroidism" In an Ayurvedic Perspective Review.
18. Ashtanga Hrudayam, Acharya Vagbhata, , Sarvangasundari, commentary, Chaukambha orientalia, reprint edition 2005, Sutrasthana - 11/2,Pg.182.
19. Ashtanga Hrudayam, Acharya Vagbhata, Sarvangasundari commentary, Chaukambha orientalia reprint edition 2005, Sutrasthana11/45,Pg 183.
20. . Ashtanga Hrudayam, Acharya Vagbhata, Sarvangasundari commentary, Chaukambha orientalia reprint edition 2005, Sutrasthana11/7,Pg 183
21. . WebMD Common and rare side effects for levothyroxine… (cited on 27/5/2016).

22. Rastogi S, Baiswar A, Nischal A, Srivastava PS, Nischal A. Effects of *shirodhara* in generalized anxiety disorder. TANG [HUMANITAS MEDICINE]. 2016 Nov 30;6(4):6-.
23. . Basler AJ. Pilot study investigating the effects of *Ayurvedic Abhyanga* massage on subjective stress experience. J Altern Complement Med. 2011;17(5):435-440. doi:10.1089/acm.2010.0281
24. Mukherjee A, Gombar V, Shamsi Y, Gupta M, Sinha S. Effectiveness of *Brahmi* in Various Illnesses: Review Paper. Herb Med. 2017;3(2):10.
25. Salve J, Pate S, Debnath K, Langade D. Adaptogenic and Anxiolytic Effects of Ashwagandha Root Extract in Healthy Adults: A Double-blind, Randomized, Placebo-controlled Clinical Study. Cureus. 2019 Dec;11(12).
26. Vijaya Saraswathy T. Effectiveness of laughter therapy on stress among senior citizens in selected community setting at Kanchipuram district (Doctoral dissertation, Adhiparasakthi College of Nursing, Melmaruvathur).
27. Wadhwa R, Khandare M. Stress Management through Yoga. Global Journal of Human-Social Science: A Arts & Humanities–Psychology. 2014;14(7).