

“HYPOTHYROIDISM” AN AYURVEDIC PERSPECTIVE – A CRITICAL REVIEW**Sahu Dustidev¹, Gupta Mahesh Chand², Indoria Anoopkumar³**¹Reader & HOD, Deptt. Of Roganidan, ²Reader, Deptt. Of Samhita and Moulik Siddhanta,³Reader, Deptt. Of Kayachikitsa Government Ayurveda College, Pancheswar Road, Junagadh, Gujarat, India**ABSTRACT**

Thyroid hormone regulates the metabolic rate of the body. Failure of thyroid hormone to meet the metabolic need of the body results in hypothyroidism. Hypothyroidism is posing a major challenge both in developing as well as developed world. The modern treatment has many adverse effects. So there is an urgent need of safe and effective Ayurvedic management. Proper Ayurvedic management needs the proper understanding of pathogenesis of hypothyroidism as per the principles of Ayurveda. This review is made with an effort to understand the disease in Ayurved perspective. On reviewing the clinical presentations of hypothyroidism from various sources it is found that in hypothyroidism there is abnormality of Jatharagni and Dhatwagni along with abnormality of Kapha and Vata Dosha as well as Rasavaha, Raktavaha, Medovaha, Sukravaha and Manovaha Srotas. These factors should be addressed during Ayurvedic management of hypothyroidism

Key words: Hypothyroidism, *Samprapti*, *Agni*, *Dosha*, *Rasavaha Srotas*

INTRODUCTION

The metabolism in human body is run by the thyroid hormone. Lack of thyroid hormone or resistance of the body tissue to the thyroid hormone with respect to metabolic demand result in disorder called hypothyroidism. Hypothyroidism is continued to posing major health challenge in both developing as well as developed world.[1] There is 4 – 5 % prevalence of hypothyroidism in developed world. The prevalence of subclinical hypothyroidism in the developed world is approximately 4-15%. The prevalence of hypothyroidism in urban India is 10.95%. Major portion of hypothyroidism (approximately 3.47 %) remain undetected. Incidence of hypothyroidism is more in females

and elderly persons. Auto immunity plays a significant role in the etiology of hypothyroidism. Every one out of five patient is manifestation of autoimmune disorder. [2] the disease hypothyroidism causes complications like dislipidemia which is a major risk factor for many serious illnesses. The hypothyroidism itself in its peak can result in life threatening condition. The treatment modalities of the hypothyroidism are also having many adverse effects. So it is the need of time to look for a safe and effective treatment for hypothyroidism is Ayurveda. To device an effective treatment the disease hypothyroidism should be understood in terms of Ayurveda principle.

This review is carried out with an aim to understand the disease hypothyroidism in principle of Ayurveda. The presentation of hypothyroidism is reviewed critically by searching pathogenesis and symptoms from various research databases. The symptoms of hypothyroidism are studied in term of imbalance of Dosha, Srotas etc and an effort is made to obtain a standard possible Samprapti of hypothyroidism.

Materials and Methods

This study is carried out by literature search and critical review of the obtained facts. The pathogenesis of hypothyroidism is obtained by searching various medical research databases like pubmed, Google scholar, Embase and other national research databases. The terms entered for search are "hypothyroidism", "hypothyroidism clinical presentation", "hypothyroidism pathogenesis", and "thyroid physiology", etc. Manual search was made by going through the reference list of retrieved articles to identify relevant additional study. The study of various Ayurvedic texts were made critically and an effort is made to understand the pathogenesis of hypothyroidism.

Observation and Discussion

Physiological effect of Thyroid Hormone

There are two major thyroid hormones T3 and T4 which effects on all body systems 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 bone growth. Carbohydrate metabolism is also regulated by the thyroid hormone as it stimulates glucose uptake, glycogenolysis, gluconeogenesis. These actions may be compared to functions

of Rasavaha Srotas as it supplies nutrition and energy to all body tissue. 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. Lipid metabolism can compared to functions of Medovaha Srotas. Thyroid hormones also increase basal metabolic rate (BMR) in all tissues except brain, spleen and gonads. This results in increased heat production, increased oxygen consumption. This increased metabolic rate also results in increased utilization of energy substrates causing weight loss. These actions can be compared to the functions of Agni in the body[3]. The adrenergic receptors in the blood vessels are also increased by the action of thyroid hormone leading to regulation of blood pressure. Thyroid hormone play a vital role in tissue growth particularly in skeletal, nervous system and reproductive system Cardiovascular action of thyroid hormones are to increase cardiac output, heart rate and contractility. They affect the respiratory system indirectly through increased BMR causing increased demand for oxygen and increased excretion of carbon dioxide. These physiological actions if look at Ayurvedic perspective are the action of Pitta and Vata Dosha. The Srotas affected by thyroid hormone are mainly Rasavaha Srotas, Mamsavaha Srotas, Medovaha Srotas, Asthivaha Srotas, Sukravaha Srotas.

Etiology of Hypothyroidism

Hypothyroidism is caused by inadequate function of the thyroid gland itself called primary hypothyroidism or by not getting enough stimulation by thyroid-stimulating hormones called secondary hypothyroidism. Primary hypothyroidism is caused by iodine deficiency, autoimmune

disease, radiation therapy, drugs or thyroid surgery.[4] So far Ayurvedic Nidan is concerned the etiological factors related to Kapha-Vata Prakopaka, Agnimandya Janaka and Rasapradoshaka Nidan will may be responsible for the genesis of hypothyroidism.

Clinical Presentation of Hypothyroidism

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 slow-

ing of metabolic process and energy expenditure. Hypothyroidism usually results in a multitude of clinical signs and symptoms. The degree of thyroid dysfunction and the time course of development of hypothyroidism determine the severity of manifestations. The symptoms of hypothyroid are very non-specific. However common presentations of hypothyroidism along with its Ayurvedic perspective are tabulated below;

Symptoms and Signs of Hypothyroidism

Symptom/Sign[5] [6] [7] [8]	Dosha Involved[9]	Srotas Involved[10] [11]
fatigue, loss of energy,	<i>Vata</i>	<i>Rasavaha</i>
Lethargy, Sleepiness	<i>Kapha</i>	<i>Rasavaha</i>
Weight gain	<i>Kapha</i>	<i>Rasavaha</i>
Decreased appetite	<i>Kapha</i>	<i>Annavaha, Rasavaha</i>
Cold intolerance, Hypothermia (only in severe hypothyroid states)	<i>Vata, Kapha</i>	<i>Rasavaha</i>
Dry skin	<i>Vata</i>	<i>Rasavaha</i>
Hair loss, Coarse, brittle, straw-like hair, Loss of scalp hair, axillary hair, pubic hair, or a combination	<i>Vata</i>	<i>Asthivaha</i>
Muscle pain, joint pain, weakness in the extremities	<i>Vata</i>	<i>Asthivaha, Mamsavaha</i>
Dull facial expression, Depression, Emotional liability, mental impairment, Forgetfulness, impaired memory, inability to concentrate	<i>Vata</i>	<i>Manovaha</i>
Hyporeflexia with delayed relaxation, ataxia, or both	<i>Vata</i>	<i>Rasavaha, Raktavaha, Manovaha</i>
Blurred vision, Decreased hearing	<i>Vata</i>	<i>Indriya</i>
Constipation	<i>Vata</i>	<i>Purishavaha</i>
Menstrual disturbances, impaired fertility	<i>Vata</i>	<i>Artavavaha, Sukravaha</i>
Decreased perspiration	<i>Vata</i>	<i>Medovaha</i>
Paresthesias, nerve entrapment syndromes	<i>Vata</i>	<i>Rasa, Meda, Majja</i>
Fullness in the throat, hoarseness	<i>Kapha</i>	<i>Pranavaha</i>
Jaundice, Pallor	<i>Pitta</i>	<i>Rasavaha Raktavaha</i>

Coarse facial features, Periorbital puffiness, Macroglossia	<i>Kapha</i>	<i>Rasavaha</i>
Goiter (simple or nodular)	<i>Kapha</i>	<i>Rasavaha, Mamsavaha, Medovaha</i>
Bradycardia, Decreased systolic blood pressure and increased diastolic blood pressure	<i>Vata</i>	<i>Rasavaha, Raktavaha</i>
Pericardial effusion, Abdominal distention, ascites (uncommon), Nonpitting edema (myxedema), Pitting edema of lower extremities	<i>Kapha</i>	

From the above table it is clear that in hypothyroidism there is abnormality of Jatharagni and Dhatwagni along with abnormality of Kapha and Vata Dosha as well as Rasavaha, Raktavaha, Medovaha, Sukravaha and Manovaha Srotas. Cardiac function and cardiovascular hemodynamics is readily regulated by the thyroid hormone T3. Hypothyroidism causes decreased cardiac contractility and cardiac output as well as increased peripheral resistance.[12]. These findings may indicate morbidity of Rasavaha Srotas in hypothyroidism. Hypothyroidism patients show increased carotid artery intima-media thickness due to arteriosclerosis, and elevated total cholesterol, elevated high density lipoprotein which improve on hormone replacement therapy.[13] In cases of overt hypothyroidism the serum triglycerides remain high and the high density lipoprotein level remain low.[14] These facts support the abnormality of Medovaha Srotas in the pathogenesis of hypothyroidism. Study show that hypothyroidism shows mild decrease in seminal volume, mild decrease in progressive forward motility of sperm and mild decrease in cumulative percentage of mobile forms of sperm.[15] Hypothyroid phase of hypothyroidism displays hypergonadotropism, low serum testosterone and

subnormal testosterone response to human chorionic gonadotropin and these abnormalities revert back on thyroxin substitution.[16] These facts support involvement of Sukravaha Srotas in hypothyroidism. Elderly patient with hypothyroidism have low Mini-Mental State Examination score than euthyroid counterpart.[17] Hypothyroidism is known to induce various neurological and mental dysfunctions[18] which supports Manovaha Srotas abnormality in this disorder.

Principle of treatment

The line of treatment with specific target to Rasavaha, Mamsavaha, Medovaha, Manovaha Srotas as well as Vata Dosha should be administered in Hypothyroidism. The few Ayurvedic drugs commonly used in practice are *Tinospora cordifolia*, *Aswagandha*, *Silajit*, *Guggula*, *Boerhavia diffusa* etc. On an experimental study it is shown that *Ashwagandha* root extract stimulates thyroidal activity and also enhances the anti-oxidation of hepatic tissue in rats. [19] *Tinospora cordifolia* is a well known immunomodulatory drug[20] which may be proved beneficial in autoimmune hypothyroidism. A case study by Kaur Jagmeet et al Reported that administration of *Kanchanara Guggulu* and *Varunadi Kashaya* significant-

ly reduce TSH level during treatment without any adverse effect.[21] Fresh ginger (*Zingiber officinale*) extracts significantly reduces total cholesterol, low density lipoprotein in the serum of propylthiouracil-induced hypothyroidic rat.[22]

CONCLUSION

Although the disease hypothyroidism is not described in classical Ayurvedic texts. Based on its clinical presentation its Sampatti (pathogenesis) can be understood as follows; Nidana-Santarpanottha, Dosha-Kapha, Vata, Dushya-Rasa, Meda, Mamsa, Asthi, Majja, Sukra, Samuththana-Amasaya, Adhithana-Sarva Sareera, Srotodushti-Sanga, Rogamarga: Abhyantara(Kostha), Srotodusti: Sanga, Agni Mandya: Ama Jatharagni Mandya Janita, Ama Rasa-Rakta Dhatvagni Jaita. During the treatment of hypothyroidism these pathogenetic factors has to be targeted with special attention to strength of body, mind, and Dosha.

REFERENCES

1. Unnikrishnan AG, Menon UV. Thyroid disorders in India: An epidemiological perspective. *Indian J Endocrinol Metab.* 2011 Jul;15(Suppl2):S78–81.
2. Unnikrishnan AG, Kalra S, Sahay RK, Bantwal G, John M, Tewari N. Prevalence of hypothyroidism in adults: An epidemiological study in eight cities of India. *Indian J Endocrinol Metab.* 2013;17(4):647–52.
3. Charaka Samhita of Agnivesha elaborated by Charaka and Drudhabala with the Ayurveda Dipika commentry by Chakrapani dutta, Sutrasthana, Chapter-12, Verse No-11, Page-80 Edited by: Vaidya Jadavji Trikamji Acharya Published by Choukhambha Surbharati Prakashan, Varanasi Edition Reprint 2005.
4. Diez JJ. Hypothyroidism in Patients Older Than 55 Years An Analysis of the Etiology and Assessment of the Effectiveness of Therapy. *J Gerontol A Biol Sci Med Sci.* 2002 May 1;57(5):M315–20.
5. Orlander PR, Griffing GT, Varghese JM, Freeman LM. Hypothyroidism Clinical Presentation [Internet]. *Medscape, Drugs & Disease.* Available from: <http://emedicine.medscape.com/article/122393-clinical>
6. Garber JR, Cobin RH, Gharib H, Hennessey JV, Klein I, Mechanick JI, et al. Clinical practice guidelines for hypothyroidism in adults: cosponsored by the American Association of Clinical Endocrinologists and the American Thyroid Association. *Endocr Pract Off J Am Coll Endocrinol Am Assoc Clin Endocrinol.* 2012 Dec;18(6):988–1028.
7. Saito I, Ito K, Saruta T. Hypothyroidism as a cause of hypertension. *Hypertension.* 1983 Jan 1;5(1):112–5.
8. Duyff RF, Bosch JV den, Laman DM, Loon B-JP van, Linssen WHJP. Neuromuscular findings in thyroid dysfunction: a prospective clinical and electrodiagnostic study. *J Neurol Neurosurg Psychiatry.* 2000 Jun 1;68(6):750–5.
9. Charaka Samhita of Agnivesha elaborated by Charaka and Drudhabala with the Ayurveda Dipika commentry by Chakrapani dutta, Sutrasthana, Chapter-20, Verse No-11,12,17,18, Page-113-115 Edited by: Vaidya Jadavji Trikamji Acharya Published by Choukhambha Surbharati Prakashan, Varanasi Edition Reprint 2005, Sloka No:
10. Charaka Samhita of Agnivesha elaborated by Charaka and Drudhabala with the Ayurveda Dipika commentry by Chakrapani dutta, Sutrasthana, Chapter-28, Verse No-9-22, Page-179 Edited by: Vaidya Jadavji Trikamji

- Acharya Published by Choukhambha Surbharati Prakashan, Varanasi Edition Reprint 2005.
11. Charaka Samhita of Agnivesha elaborated by Charaka and Drudhabala with the Ayurveda Dipika commentary by Chakrapani Dutta, Sutrasthana, Chapter-24, Verse No-25-27, Page-125 Edited by: Vaidya Jadavji Trikamji Acharya Published by Choukhambha Surbharati Prakashan, Varanasi Edition Reprint 2005.
 12. S D, I K. Thyroid hormone and the cardiovascular system. *Minerva Endocrinol.* 2004 Sep;29(3):139–50.
 13. Monzani F, Caraccio N, Kozakowà M, Dardano A, Vittone F, Viridis A, et al. Effect of Levothyroxine Replacement on Lipid Profile and Intima-Media Thickness in Subclinical Hypothyroidism: A Double-Blind, Placebo- Controlled Study. *J Clin Endocrinol Metab.* 2004 May;89(5):2099–106.
 14. Abdel-Gayoum AA. Dyslipidemia and serum mineral profiles in patients with thyroid disorders. *Saudi Med J.* 2014 Dec;35(12):1469–76.
 15. Hernández JJC, García JMM, García Díez LC. Primary Hypothyroidism and Human Spermatogenesis. *Syst Biol Reprod Med.* 1990 Jan 1;25(1):21–7.
 16. Kumar J, Khurana ML, Ammini AC, Karmarkar MG, Ahuja MMS. Reproductive Endocrine Functions in Men with Primary Hypothyroidism: Effect of Thyroxine Replacement. *Horm Res.* 1990;34(5-6):215–8.
 17. Ceresini G, Lauretani F, Maggio M, Ceda GP, Morganti S, Usberti E, et al. Thyroid Function Abnormalities and Cognitive Impairment in Elderly People: Results of the Invecchiare in Chianti Study: THYROID FUNCTION, AGING, AND COGNITION. *J Am Geriatr Soc.* 2009 Jan;57(1):89–93.
 18. Monzani F, Guerra PD, Caracciolo N, Pruneti CA, Puccil E, Luisit M, et al. Subclinical hypothyroidism: neurobehavioral features and beneficial effect of l-thyroxine treatment. *Clin Investig.* 1993 May 1;71(5):367–71.
 19. Panda S, Kar A. Changes in Thyroid Hormone Concentrations after Administration of Ashwagandha Root Extract to Adult Male Mice. *J Pharm Pharmacol.* 1998;50(9):1065–8.
 20. Upadhyay AK, Kumar K, Kumar A, Mishra HS. *Tinospora cordifolia* (Willd.) Hook. f. and Thoms. (Guduchi) – validation of the Ayurvedic pharmacology through experimental and clinical studies. *Int J Ayurveda Res.* 2010;1(2):112–21.
 21. Kaur J, Chouhan M. Kanchanar Guggulu and Varunadi Kashaya in Hypothyroidism - A Case Study. *Int J Ayur Pharma Res.* 2014;2(2):58–60.
 22. Al-Noory AS, Amreen A-N, Hymoor S. Antihyperlipidemic effects of ginger extracts in alloxan-induced diabetes and propylthiouracil-induced hypothyroidism in (rats). *Pharmacogn Res.* 2013;5(3):157–61.

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