



Role of Medicinal herbs in the management of Hypothyroidism

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Abstract

Siddha System of Medicine is one of the ancient traditional medical system is being practiced in the Southern part of India and addressed as one of the greatest arts of Tamil Nadu. The Line of treatment is based on the *Panchabootha* principle (Five element theory) which is blended with human nature and the diagnosis is rooted through *Naadiparikshai* (Pulse reading). *Vatham* (Wind), *Pitham* (Fire), *Kapahm* (Water) which are the Thridosha humours of the physiological mechanism stands for the wellness of human being. when they deviates from the state it bring the disease.

There are abundant herbs are useful in treating hormonal imbalance in medical practice which falls under the Siddha herbal kingdom. Hypothyroidism is divided in primary and secondary. Primary hypothyroidism is most commonly caused by chronic auto immune thyroiditis, less common causes radioiodine treatment and thyroidectomy. Secondary hypothyroidism due to failure of adequate thyroid stimulating hormone secretion from the pituitary gland. Thyroid abnormalities were diagnosed on the basis of laboratory results [serum FT3, FT4, and TSH]. The prevalence of hypothyroidism in the developed world is about 4-5% and the subclinical hypothyroidism is about 4-15%.

Keywords

Siddha, hypothyroidism, thyroid gland, metabolic deficiency symptoms.

Keywords

Oil Bath, Siddha System, Medicated Oil, Bath Powder.

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CODEN : IJRPHR

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To access this article online

Website : <http://www.ijrphr.com/>

DOI : 10.121/ijrphr/02.0203.339

Quick response code



How to cite this article:

Rega M, Eniyaranjani T, Role of Medicinal herbs in the management of Hypothyroidism, International Journal of Reverse Pharmacology and Health Research, 2019, 2(2), 89.

Received: March, 2019.

Accepted: May, 2019.

INTRODUCTION

Hypothyroidism affects between 4% and 10% of the population, and the prevalence of subclinical hypothyroidism is reported to be as high as 10% in various studies. A Thyroid condition that is underactive is called hypothyroidism and is often marked by low iodine levels. Hypothyroidism is diagnosed when low levels of the thyroid hormones result in elevated levels of thyroid-stimulating hormone (TSH), whereas subclinical hypothyroidism is diagnosed when TSH levels are elevated above the upper limit of the assay reference range with normal thyroid hormone levels.

Thyroid gland is small endocrine gland and major gland in our body located in front of the trachea in the throat. It produces the thyroid hormones such as triiodothyronine (T3) and thyroxine (T4) which increases cellular metabolism as well as our heart rate, how quickly we burn calories, digestion etc..

The amount of thyroid hormones secreted is controlled by another hormone called thyroid stimulating hormone, which is released from pituitary gland in our head.

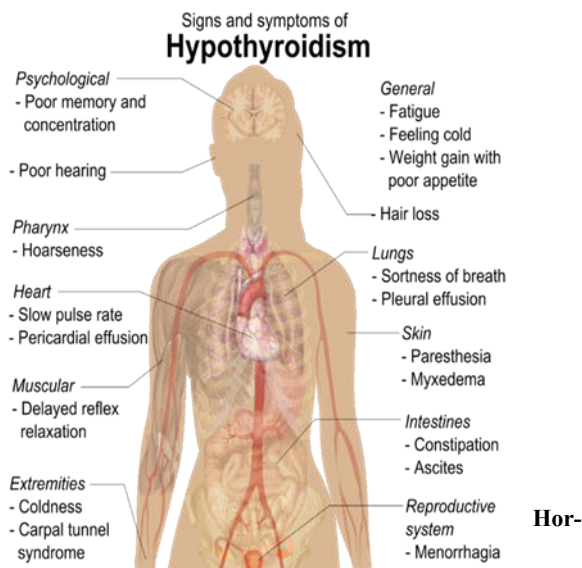
Disease of thyroid

Disorder of thyroid, is unspecified E07.9 which is a billable/specific ICD-10-CM code that can be used to indicate a diagnosis for reimbursement purposes. The 2019 edition of ICD-10-CM E07.9 became effective on October 1, 2018. This is considered to be an important classification in International disease classification process.

Types of Hypothyroidism

1. Primary
2. Secondary

SIGNS AND SYMPTOMS OF HYPOTHYROIDISM



mones of thyroid gland T3/T4 are regulation

BASAL METABOLISM

This hormone increases BMR, body temperature, appetite, carbohydrate, lipid & protein metabolism promotes glucose metabolism for energy, stimulate protein synthesis, increase lipolysis,

enhance cholesterol excretion in bile. (1) Basal metabolic rate (BMR) contributes approximately 60–75% of daily energy expenditure and it is important to body weight regulation. A decline in the BMR with age has been described in a number of early cross-sectional studies estimated that the decline in basal metabolism was less than 1–2% per decade from the second to the seventh decade of life. (2)

HEART

Thyroid hormones play an important role in the normal function of heart and vascular physiology, and hypothyroidism produces profound cardiovascular effects. Of recent clinical interest is the effect of subclinical hypothyroidism on cardiovascular disease and whether or not it should be treated. It Promote normal cardiac function. Hypothyroidism is associated with decreased cardiac output due to impaired relaxation of vascular smooth muscle and decreased availability of endothelial nitric oxide. (3)

These are the cardiac genes upregulated such as α -Myosin heavy chain, Sarcoplasmic reticulum, Ca^{2+} -ATPase, Na^+/K^+ -ATPase, β_1 -Adrenergic receptor, Thyroid hormone receptor α_1 , Atrial natriuretic hormone, Voltage-gated potassium channels and downregulated few cardiac genes such as β -Myosin heavy chain, Phospholamban, Adenylyl cyclase catalytic subunits and $\text{Na}^+/\text{Ca}^{2+}$ exchanger. (4)

NERVOUS SYSTEM

Thyroid disorders of the thyroid gland are common and frequently accompanied by neurologic complications. The thyroid hormone regulated normal neuronal development in fetus and infant, promotes normal neuronal function in adult, and enhances effects of sympathetic nervous system. The neurologic complications of thyroid disease may be the direct result of changes in the levels of thyroid hormones, may arise from immune-mediated mechanisms, or else may be the result of mechanical compression of neural structures.

MUSCULO SKELETAL

Thyroid dysfunction in musculoskeletal symptoms and signs. Notable complication of hypothyroidism are pain and stiffness of joints and muscles, weakness and cramps of muscles and synovitis etc. It Promotes normal body growth and maturation of skeleton.

METHODOLOGY

This literature review study was performed from scientific data of hypothyroidism herbs have collected from published papers from major database. They are compared and justified with siddha literature.

Siddha Medicinal Plants on Thyroid functions:

Withania somnifera

Common name: Ashwagandha

Family name: Solanaceae

Part used: Root

Active compound: Alkaloids, Steroidal Lactones, Withanolides, Withaferin

Medicinal uses:

Withania somnifera can increase serum levels of thyroid hormones in humans. The important function of withania somnifera root extract is the regulation of thyroid function. Although the extract increase serum T3 and T4 concentration and hepatic glucose 6-phosphatase activity. It was concluded that the extract stimulates thyroid activity and also reduces lipid peroxidation of hepatic. Also clinical study on *Withania somnifera* was performed at Sudbhawana Hospital, Varanasi, India between May 2016 and September 2016.

Fifty subjects with elevated serum thyroid stimulating hormone (TSH) levels (4.5-10 μ IU/L) aged between 18 and 50 were randomized in either treatment (n = 25) or placebo (n = 25) groups for an 8-week treatment period and results were significant.(5)

Bacopa monnieri

Common name: Brahmi

Family name: plantaginaceae

Part used: Plant extract

Active compound: Bacosids, Monnierasids, Bramine.

Medicinal uses: This extract which increase both T3 and T4 level. The brahmi has direct thyroid stimulating activity. It has ability to directly act on thyroid gland to and bring about rise in serum level of thyroid hormones¹. Animal study was conducted in Bacopa monnieri leaf extracts in the regulation of thyroid hormone concentrations in male mice were studied and the serum levels of both T(3) and T(4) concentration was increased by B. monnieri extract suggesting its thyroid-stimulating role.

Coleus forskholii/Plectranthus barbatus

Common name: Coleus

Family name: Lamiaceae

Part used: Root

Active compounds: Forsk Holin

Medicinal uses: Coleus forskholii the effect of TSH in regards to iodine uptake, organification of iodine thyroglobulin, T3 and T4 production and also promotes secretion of T3 and T4. coleus extracts play an important role in thyroid function. Coleus mildly stimulates the metabolism by increasing thyroid hormones and increase secretion of insulin⁵. It can reduce the weight, hypotension, increase gastric acid secretion, improves immunity, increase energy levels(6)

Commiphora mukul

Common name: Gukkul

Family name: Burseraceae

Part used: Resin

Active compound: Guggulsterone, guglipid

Medicinal uses:

Guggul herb is a ketosteroid from the oleo-resin of Commiphora Mukul and it contains trans pregnandiene 3, 16-dione; Z-guggulsterone etc. This drug is having a strong thyroid stimulatory action when administered to albino rats. It increases in iodine-uptake by thyroid and enhanced activities of thyroid peroxidase and protease as well as oxygen consumption by isolated slices of liver and biceps muscle.(7) Gum guggul herb that effective in treat Hypothyroidism. It raise T3 and T4 ratio and stimulating thyroid function. Guggul has shown thyroid stimulating activity but not via the pituitary TSH mechanism. It is thought to have a direct action on the thyroid gland⁷. It has a hypolipidemic, antioxidant and cholesterol lowering agent that stimulates a sluggish or low functioning thyroid gland.(8)

Bauhinia purpurea

Common name : Orchid tree

Family name: Fabaceae

Part used: Bark extract

Active compound: Bioflavonoid, Sitosterol, Isoquercitin

Medicinal uses:

Bark extract increase both T3 and T4 levels. The effects of daily administration of amukara root extract and bauhinia purpurea bark extract for 20 days increase T3 and T4 level significantly Bauhinia variegata whole plant alcohol extract-preventive against goiter.

The Bauhinia purpurea bark extract (2.5 mg/kg body wt.) was investigated in vivo animal models. The serum triiodothyronine (T3) and thyroxine (T4) concentrations were increased significantly by Bauhinia, and it enhance serum T4 concentration. The bark extract increases hepatic glucose-6-phosphatase (G-6-Pase) activity and antiperoxidative effects as indicated either by a decrease in hepatic lipid peroxidation (LPO) and/or by an increase in the activity of antioxidant enzymes. Finally, It appears that, it is stimulating thyroid function in humans. (9)

Biological activity: Thyroid hormone regulating activity.

HERBS USED FOR THE TREATMENT OF HYPOTHYROIDISM

Humulus lupulus

Common English name: Hop

Family name: Cannabinaceae

Part used : leaf and flowers

Active compound: Xanthohumol

Medicinal uses:

Radovic et al demonstrated the Xanthohumol action from humulus lupulus which stimulates iodide uptake in rat thyroid-derived FRTL-5 cells.(10). The Thyrocytes possibly by influencing the activity of sodium iodide symporter, a key protein in thyroid hormone production, the effect actually makes xanthohumol a potential candidate for improving radioactive ablation of the thyroid gland by means of stimulating better radio iodine concentration. Sodium-iodide-symporter (NIS), an integral plasma membrane glycoprotein, mediates the sodium-dependent active uptake of iodide (I(-)) into the thyroid gland, which is a fundamental step in thyroid hormone synthesis.

Saccharina japonica

Common name: kelp

Family name :Phaeophyceae (brown algae)

Description:

This is a marine herb. This sea weed thrives well in shallow water with temperature ranging between 6&14°C which can grow as fast as half a meter per day.

Active compound:

Several minerals, elements, amino-acids, including iodine, calcium potassium, magnesium, iron and B-vitamins.

Medicinal uses :

This herb is used by herbalists to treat underactive thyroid gland. Iodine plays crucial role in the production of thyroid hormones. It is found to be helpful in weight loss goiters, lower Bp and fatigue caused by sluggish thyroid gland. Kelp is one of the most popular ingredients used in herbal concoctions for treating hypothyroidism. Few case reports also documented on this plant, which suppressing thyroid functions.

This history of the cases reveals that, the iodine made out from the salts were consumed by those cases and results in mal-thyroid functions seen. Thereby the case was reported and noted.

Fucus vesiculosus

Family : Fucaceae

Common name : Bladder wrack

Active compound: It enriched with 3 amino acids including iodine alginic acid and fucoidin.

Part used :Thallus to prepare liquid extract

Medicinal uses :

Fucus vesiculosus is one of Laminariales that belong to the family of seaweed. It has a long history of use as food and medication due to its biological properties. Few studies suggested that, this sea weed reduces the thyroid function and also have preventive role and positive effects on thyroid gland. It contains a natural balance of minerals from the sea as well as significant amounts of iodine an element necessary for the thyroid hormones produce naturally.

Diet for hypothyroidism

To maintain the bodily temperature mechanism it is advised to take enough fruits, vegetables and plenty of water in the diet. Advised lot of sea vegetables like kelp (underground sea plant), nori (red algae), seaweeds and sea foods, iodized salt,sushi (underground sea plant), more exercises and low consumption of food, low glycemic, high fiber and low calorie diets.

Food to avoid for hypothyroidism

These foods must be avoided in order to prevent the recurrence of the hypothyroidism symptoms. Avoiding them will also prevent aggravating the already aggravated thyroid glands.

- Spinach (SPINACIA OLIRACEA)
- Peanuts (ARACHIS HYPOGAEA)
- Coffee (COFFEA ARABICA)
- Cauliflower (BRASSICA OLERACEA)
- Linseed (LINUM USITATISSIMUM)
- Millet (PENNISETUM GLAUCUM)
- Cabbage (BRASSICA OLERACEA)

GOITROGENIC FOODS TO AVOID FOR HYPOTHYROIDISM

The food items listed below can impede your body's ability to absorb iodine and when your body can't absorb iodine your thyroid gland will swell and eventually develop goiter. Some of the food listed above can also be goiterogenic.

- Bamboo shoots (BAMBOOSA VALGARIS)
- Soybean& related products (GLYCINE MAX)
- Canola oil (BRASSICA NAPUS)
- Sweet potato (IPOMOEA BATATAS)
- Foods with gluten

Yoga for Hypothyroidism

- Yoga can help with hypothyroidism
- General yoga Exercise and pranayamam (breathing techniques)
- Yoga to help boost your Immunity and get rid of negative emotions.

Sarvangasanam

It is belived to be most effective and ideal asanam(position)for the thyroid gland.this powerful posture places a great amount of pressure on the thyroid gland that dramatically changes the function by squeezing out the stagnant secretions and improving the blood circulation.

Halasanam

Matchasanam

Surya namaskaram

Yoga Patchimottasana

CONCLUSION

Now a days Many peoples are suffering from thyroid dysfunction due to physical inactivity, consumption of fast food. Many people are interested in herbs that can help restore their health back to normal. When combined with other nutritional supplements some potent herbs are found to be useful in managing the symptoms of hypothyroidism.

SOURCE OF FUNDING

Nil

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

REFERENCES

1. Kim B. Thyroid hormone as a determinant of energy expenditure and the basal metabolic rate. *Thyroid Off J Am Thyroid Assoc.* 2008 Feb;18(2):141–4.
2. Welcker J, Chastel O, Gabrielsen GW, Guillaumin J, Kitaysky AS, Speakman JR, et al. Thyroid Hormones Correlate with Basal Metabolic Rate but Not Field Metabolic Rate in a Wild Bird Species. *PLoS ONE* [Internet]. 2013 Feb 20 [cited 2019 Sep 16];8(2). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3577771/>
3. Udovcic M, Pena RH, Patham B, Tabatabai L, Kansara A. Hypothyroidism and the Heart. *Methodist DeBakey Cardiovasc J* [Internet]. 2017 [cited 2019 Sep 16];13(2):55–9. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5512679/>
4. Klein Irwin, Danzi Sara. Thyroid Disease and the Heart. *Circulation* [Internet]. 2007 Oct 9 [cited 2019 Sep 16];116(15):1725–35.
5. Sharma AK, Basu I, Singh S. Efficacy and Safety of Ashwagandha Root Extract in Subclinical Hypothyroid Patients: A Double-Blind, Randomized Placebo-Controlled Trial. *J Altern Complement Med N Y N.* 2018 Mar;24(3):243–8.
6. Kar A, Panda S, Bharti S. Relative efficacy of three medicinal plant extracts in the alteration of thyroid hormone concentrations in male mice. *J Ethnopharmacol.* 2002 Jul;81(2):281–5.
7. Panda S, Kar A. Guggulu (Commiphora mukul) potentially ameliorates hypothyroidism in female mice. *Phytother Res PTR.* 2005 Jan;19(1):78–80.
8. Tripathi YB, Malhotra OP, Tripathi SN. Thyroid Stimulating Action of Z-Guggulsterone Obtained from Commiphora mukul. *Planta Med.* 1984 Feb;50(1):78–80.
9. Panda S, Kar A. Withania somnifera and Bauhinia purpurea in the regulation of circulating thyroid hormone concentrations in female mice. *J Ethnopharmacol.* 1999 Nov 1;67(2):233–9.
10. Radović B, Schmutzler C, Köhrle J. Xanthohumol stimulates iodide uptake in rat thyroid-derived FRTL-5 cells. *Mol Nutr Food Res.* 2005 Sep;49(9):832–6.