

Nature's Intervention in Thyroid Regulation

Sejal S. Rathod^{*1}, Shailju Gurunani², Sonal Motghare³

^{1,2,3} Priyadarshini J L College of Pharmacy, Nagpur, India

Received: 22nd Sept, 25; Revised 12th Oct, 25, Accepted: 10th Nov, 25; Available Online: 23th Nov, 25

ABSTRACT

The neural and neuroendocrine systems play a pivotal role in maintaining homeostasis in the human body, with the thyroid gland serving as a crucial regulator through secretion of thyroid hormones triiodothyronine (T3) and thyroxine (T4). Disruptions in thyroid hormone production lead to common disorders such as hypothyroidism and hyperthyroidism, affecting growth, metabolism, and overall health. Conventional management involves lifelong medication, yet alternative systems of medicine—including naturopathy, Ayurveda, homeopathy, Unani, Siddha, and yoga offer complementary therapeutic strategies. Herbal remedies (*Ashwagandha*, *Guggul*, *Ginseng*, *Indian coleus*), hydrotherapy, massage, acupuncture, mud therapy, and dietary interventions (gluten-free diet, iodine-rich foods, vitamin B, selenium) are reported to restore thyroid function and alleviate symptoms. Ayurvedic approaches emphasize correction of Agni imbalance, while Siddha, Unani, and homeopathy focus on constitutional treatments to improve thyroid performance. Yoga and pranayama further enhance thyroid hormone regulation and overall well-being. Collectively, these integrative approaches suggest potential in managing thyroid dysfunction holistically, reducing dependency on synthetic drugs and improving quality of life.

Keywords: Thyroid disorders, T3, T4, homeostasis, hypothyroidism, hyperthyroidism, naturopathy, Ayurveda, Siddha, Unani, homeopathy, yoga, herbal medicine, hydrotherapy, acupuncture, diet therapy, alternative medicine

INTRODUCTION

The neural and neuroendocrine systems are important for controlling and preserving homeostasis in the human body. While the neurological system enables quick neuronal transfer of information between various bodily parts via the brain, spinal cord, and nerves, the neuroendocrine system promotes homeostasis by secreting and transporting hormones to target sites via the bloodstream. In order to maintain homeostasis, both systems constantly interact and have an impact on one another. Hormones that are neuroendocrine are essential for controlling body processes. Numerous processes, including growth and development, metabolism, reproduction, and electrolyte balance, are impacted (Hiller-Sturmh et al., 1998). These hormones are produced and regulated by a large number of glands spread throughout the body (see Fig. 1A). Thyroid hormones (triiodothyronine (T3) and thyroxine (T4)) (Nilsson et al., 2017) and iodine (Colucci et al., 2010) are produced, stored, and released by the thyroid gland, which is situated in the frontal region of the neck in humans (Beynon et al., 2016). T3 is the active form of thyroid hormone (Idrees et al., 2019). The predicted daily generation of T3 and T4 under normal conditions is 30µg and 100µg, respectively (Chiovato et al., 2019). Although both substances are active, T3 usually has a 10-fold greater affinity for thyroid receptors than T4. Importantly, research has demonstrated that the thyroid gland's daily synthesis of T3 is insufficient to meet needs. Thus, iodothyronine deiodinases catalyse the conversion of T4

into T3 via-deiodination, which accounts for around 80% of daily T3 (Fig. 1B).

The primary distinction between T3 and T4 is the quantity of iodine groups. Thyroid stimulating hormone (TSH) stimulates the thyroid gland, which in turn produces thyroid hormones (Mullur et al., 2014). Thyroid hormones are crucial for preserving physical, mental, and cardiovascular health in addition to their function in controlling metabolism and growth and development (Kamali et al., 2020). Under typical circumstances, the hypothalamic-pituitary-thyroid (HPT) axis regulates thyroid hormone production through a negative feedback loop (Colucci et al., 2010). In this loop, low plasma levels of T4 and T3 trigger the hypothalamus to release thyrotropin-releasing hormone (TRH). The pituitary then releases TSH in response to the production of TRH, which in turn triggers the thyroid gland to produce T3 and T4. On the other hand, excessive T3 and T4 feedback reduces TRH production. The feedback loop is completed when low TRH levels suppress TSH production (Mariotti et al., 2000). Hyperthyroidism and hypothyroidism are the two most prevalent forms of thyroid diseases. While the latter is characterized by insufficient thyroid hormone production, the former is characterized by excess thyroid hormone production and secretion. Between 2 and 6% of the population suffers from these illnesses (Wouters et al., 2020).

In addition to pharmaceutical interventions, natural remedies have long been utilized in traditional systems of medicine to restore thyroid balance and promote overall

*Author for Correspondence: sejalrathod1829@gmail.com

endocrine health. Approaches from naturopathy, Ayurveda, homeopathy, Unani, and Siddha emphasize holistic management through lifestyle regulation, dietary practices, and mind-body therapies. Along with these, proper nutrition, exercise, and stress management are considered essential in maintaining thyroid function. Together, these approaches highlight nature's contribution as a complementary pathway in thyroid care.

NATUROPATHY:

A type of alternative medicine known as naturopathy or naturopathic medicine uses a variety of alternativescientific techniques that are promoted as "natural," "non-invasive," and "self-healing." Rather of being grounded on evidence-based medicine, naturopathy's philosophy and practices are rooted in vitalism and traditional medicine (Jagtenberg et al., 2006). Hypothyroidism can result from the thyroid gland producing insufficient quantities of thyroid hormone; hyperthyroidism can result from the thyroid gland producing excessive hormone. Fatigue, dry skin, constipation, muscle weakness, weight gain or loss, hair thinning, depression, and amnesia are some of the symptoms of hypo/hyperthyroidism. Thyroid diseases progress gradually, but they can be reversed with the right naturopathic treatments, restoring the gland's normal function.

Herbs

Thyroid conditions are commonly treated with herbs, which are an essential component of naturopathic medicine. Herbs such as *Ashwagandha*, *Gum guggul*, *Asian ginseng*, and *Indian coleus* are used to help underactive thyroid glands operate better. Thyroid hormones T3 and T4 can be overproduced if these are consumed in excess, so caution must be used to ensure that the right levels are consumed.

Hydrotherapy

The foundation of hydrotherapy is the idea that, when used in different ways, water can be the most powerful healing agent. The location, pressure, temperature, and timing of hydrotherapy all affect how beneficial it is. Similar to hot and cold therapy, hydrotherapy can lower thyroid antibodies and enhance thyroid function. Numerous localized neck-related ailments, including hoarseness of voice, swallowing difficulties, throat lumps, and shrinking thyroid nodules, can also be treated with hydrotherapy.

Massage

Massages are one of the main alternative treatment modalities for thyroid dysfunction in many naturopathy centers throughout the world. The thyroid and adrenal glands can function better when reflexology treatments are used in conjunction with appropriate massages. The majority of the time, essential oils are used during massages to further stimulate the thyroid and adrenal glands.

Acupuncture

Thyroid hormone levels can be effectively balanced with the use of acupuncture. Regular acupuncture can enhance thyroid hormone markers in people with thyroid dysfunction, according to research published in the Journal

of Integrative Medicine. Additionally, acupuncture eases tense muscles and anxiety, two prominent signs of hypothyroidism.

Mudtherapy

Mud therapy aids in the body's removal of toxins and pollutants, restoring the thyroid glands' natural function. Thyroid gland function performs at its best when toxins build up in the body. This results in less T3 and T4 thyroid hormone output, which can cause fatigue, excessive sleep, and other symptoms.

Gluten-Freediet

Thyroid diseases are mostly controlled by diet, and patients who follow a gluten-free diet frequently experience notable improvements in thyroid hormone-related problems. Because gluten can harm the stomach lining and interfere with thyroid hormones, people who are sensitive to it are more likely to develop thyroid-related conditions. Additionally, iodine, a crucial element required to maintain thyroid hormone balance, is replaced by bromide during the processing of gluten (Prakash, 2021).

AYURVEDA:

The current situation's altered lifestyle has caused a number of biological systemic imbalances. One such manifestation is hypothyroidism, which is said to be a prevalent medical condition in India. According to Ayurveda, the pathogenesis of hypothyroidism is primarily caused by aberrant Agni functioning, which alters Dhatwagni and ultimately triggers a pathological sequence, leading to the development of the disease condition. Ayurvedic principles can be used to manage this condition. Triphaladya guggulu and Punarnavadi Kashaya can be used to treat hypothyroidism cases that manifest as dry and coarse skin, weakness, lethargy, weariness, and puffiness of the face and eyelids (Karishma et al.).

After receiving snehapaana, swedana, and virecana, the patient was given medicated milk made with sataavari, saaribaa, candana, and useera on a regular basis for a year. After using ayurvedic medications for two months, symptoms began to subside and blood parameters began to return to normal. The patient was instructed to gradually discontinue taking modern medication. The results of this study demonstrate how effective ayurvedic formulations are at treating hyperthyroidism (Smruthi et al., 2023).

The plant *Bacopa monnieri* (*Brahmi*), also known as *Brahmi*, may be used therapeutically to treat clinical disorders linked to hypothyroidism (Vigneshwar et al., 2021).

TINCTURES FROM HOMEOPATHY:

Compared to traditional medicine, which typically requires lifelong treatment, a homeopathic approach with appropriate medication selection, potency, and dosage repetition is more scientific and shows promise in treating endocrine disorders. Therefore, rather than being recommended as a specific treatment, the homeopathic drug Iodium was prescribed based on the individualization and completeness of the symptoms. As medication was administered on a constitutional basis, in addition to elevated TSH levels, additional problems such anxiety, irregular menstruation, hair loss, and weakness during

periods were also resolved (Wadhwa et al.). Hyperthyroidism has been treated with homeopathic remedies that contain herbal extracts from *Melissa officinalis* (lemon balm) and *Lycopus* (bugleweed) (Kaplan et al., 2021). When treating primary hypothyroidism, thyroidinum 3X speeds up the healing process. When

allopathic Levothyroxine was used in conjunction with the homeopathic medicine Thyroidinum 3X, no negative side effects were seen. Thyroidinum 3X is quite helpful in treating the symptoms of hypothyroidism, according to the proportion of symptomatic improvement (50% to 90%) (Kiruthiga et al., 2018)

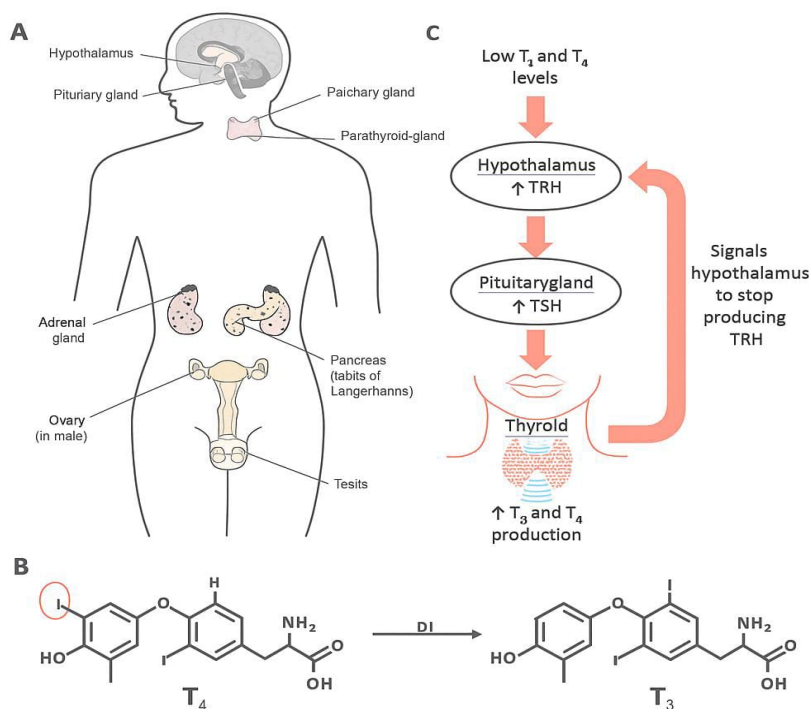


Figure 1: Representation of the endocrine organs in the body, including both male and female organs (A). Reproduced with permission from: (Hiller-Sturm et al., 1998). Conversion reaction of T_4 to T_3 catalysed by deiodinase (DI) enzymes in cells (B). Schematic diagram of the HPT feedback loop (C).

UNANI:

Hypothyroidism This is referred to as hypothyroidism in modern medicine or Qillat-e-Darqia in the Unani system of medicine. Hashimoto's thyroiditis and autoimmune thyroiditis are additional names for it. Unani formulations are tested for autoimmune hypothyroidism. The patients reported feeling lighter and more well-rounded, and the formulation had no negative side effects (Islam et al., 2011).

REGULATING FOOD HABITS:

Reduce In Sugar Intake

In general, excessive sugar consumption is unhealthy, but it is particularly detrimental to those with thyroid hormone imbalance because the gland plays a crucial role in controlling the metabolism of carbohydrates. Fatigue, weight gain, and metabolic disturbance might result from an imbalance in blood sugar levels caused by the thyroid gland's insufficient hormone production.

Eating Food That Is High In Iodine

One essential mineral that supports the synthesis of thyroid hormone is iodine. So, eat things like cheese, yogurt,

oysters, shrimp, seaweed, and marine veggies. Additionally, beneficial are iodine supplements or iodized salt.

Vitamin B And Selenium

Due to its varied interactions with thyroid function and hormone regulation, the B group of vitamins can provide much-needed benefits to those with hypothyroidism. Green leafy vegetables, seeds, nuts, whole grains, legumes, yogurt, and milk are all excellent providers of vitamin B. Thyroid hormone metabolism is one of the many vital roles of the mineral selenium. Thyroid disorders are also prevented when the body has an optimal amount of selenium. Pasta, rice, oatmeal, Brazil nuts, legumes, and nuts are a few foods high in selenium. For the greatest benefits, it is crucial to heed the doctor's advised when determining how much of these foods to eat (Prakash, 2021).

EXERCISE:

Yoga: Even though hypothyroidism is now a well-known condition, it can be successfully treated with strict commitment to the traditional yoga practice. A study that was published in PubMed found that six months of yoga practice improved cholesterol and thyroid hormones. Yoga

improves general wellbeing and lowers mental stress levels in individuals. Yoga exercises like Salamba Sarvangasana, Matsyasana, Halasasana, Setu Bandha Sarvangasana, and Navasana can help strengthen the neck and increase blood flow to the area. Thyroid hormone secretion can be regularized with regular practice of Ujjayi and Bhramari pranayama (Baishya et al., 2024).

Table 1: Yoga schedule for sub clinical hypothyroidism (Nair et al., 2021).

Practice	Duration (min)
Opening prayer	3
Breathing practices	5
Loosening exercise	12
Suryanamaskara	5
Asanas	20
Kriya	1
Pranayamas and bandha	7
Relaxation	7
Total duration	60

SIDDHA:

One of India's oldest medical systems is the Siddha system. Kuraiveethana noi was more common among women, desk workers, people with anxiety disorders, and those with Kabavatham body constitution. Kuraiveethana noi was discovered to be connected to Kabapitha naadi. There has been a statistically significant improvement in the treatment of hypothyroidism with Lashuna Siddha Tailpana Poorvak Vamana Karma and Nitya Virechana by Gomutra Haritaki. When it comes to controlling hypothyroidism, Lashuna Siddha Tailpana Poorvak Vamana Karma works better than Gomutra Haritaki's Nitya Virechana (Tokle et al., 2021).

CONCLUSION:

The neural and neuroendocrine systems are essential for maintaining homeostasis in the human body. Hormones, such as thyroid hormones (T3 and T4) and iodine, control various body processes. Thyroid glands produce, store, and release these hormones, with T3 having a 10-fold greater affinity for thyroid receptors than T4. Thyroid diseases can result from insufficient or excessive hormone production. Treatments include naturopathy, hydrotherapy, massages, acupuncture, mud therapy, gluten-free diet, and Ayurveda. Herbs like *ashwagandha*, *gum guggul*, *Asian ginseng*, and *Indian coleus* help underactive thyroid glands function better. Hydrotherapy can lower thyroid antibodies and enhance thyroid function, while massages stimulate the thyroid and adrenal glands. Acupuncture balances thyroid hormone levels and eases hypothyroidism symptoms. Gluten-free diets can control thyroid hormone-related problems. Ayurvedic principles can manage hypothyroidism. Homeopathy, with appropriate medication selection and dosage repetition, shows promise in treating endocrine disorders.

REFERENCES

- Hiller-Sturmhöfel, S., & Bartke, A. (1998). The endocrine system: An overview. *Alcohol Health & Research World*, 22(3), 153–164.
- Beynon, M. E., & Pinneri, K. (2016). An overview of the thyroid gland and thyroid-related deaths for the forensic pathologist. *Academic Forensic Pathology*, 6(2), 217–236. <https://doi.org/10.23907/2016.024>
- Nilsson, M., & Fagman, H. (2017). Development of the thyroid gland. *Development*, 144(12), 2123–2140. <https://doi.org/10.1242/dev.145615>
- Colucci, P., Yue, C. S., Ducharme, M., & Benvenga, S. (2010). A review of the pharmacokinetics of levothyroxine for the treatment of hypothyroidism. *European Endocrinology*, 9(1), 40–47. <https://doi.org/10.17925/EE.2013.09.01.40>
- Idrees, T., Price, J. D., Piccariello, T., & Bianco, A. C. (2019). Sustained release T3 therapy: Animal models and translational applications. *Frontiers in Endocrinology*, 10, 544. <https://doi.org/10.3389/fendo.2019.00544>
- Chiovato, L., Magri, F., & Carlé, A. (2019). Hypothyroidism in context: Where we've been and where we're going. *Advances in Therapy*, 36(1), 47–58. <https://doi.org/10.1007/s12325-019-01080-8>
- Mandel, S. J. (1993). Levothyroxine therapy in patients with thyroid disease. *Annals of Internal Medicine*, 119(6), 492–502. <https://doi.org/10.7326/0003-4819-119-6-199309150-00009>
- Wartofsky, L. (2013). Combination L-T3 and L-T4 therapy for hypothyroidism. *Current Opinion in Endocrinology, Diabetes and Obesity*, 20(5), 460–466. <https://doi.org/10.1097/01.med.0000432611.03732.49>
- ullur, R., Liu, Y.Y., & Brent, G. A. (2014). Thyroid hormone regulation of metabolism. *Physiological Reviews*, 94(2), 355–382. <https://doi.org/10.1152/physrev.00030.2013>
- Kamali, H., Khodaverdi, E., Kaffash, E., Saffari, A. S., Shiadeh, S. N. R., Nokhodchi, A., & Hadizadeh, F. (2020). Optimization and in vitro evaluation of injectable sustained-release of levothyroxine using PLGA-PEG-PLGA. *Journal of Pharmaceutical Innovation*. <https://doi.org/10.1007/s12247-020-09480->
- Mariotti, S., & Beck-Peccoz, P. (2000). Physiology of the hypothalamic-pituitary-thyroid axis. In L. J. De Groot, G. Chrousos, K. Dungan, et al. (Eds.), *Endotext*. MDText.com, Inc.
- Wouters, H. J. C. M., Slagter, S. N., Muller Kobold, A. C., van der Klauw, M. M., & Wolffenbuttel, B. H. R. (2020). Epidemiology of thyroid disorders in the life-lines cohort study (The Netherlands). *PLOS ONE*, 15(11),

- e0242795.
<https://doi.org/10.1371/journal.pone.0242795>
13. Jagtenberg, T., Evans, S., Grant, A., & Howden, I. (2006). Evidence-based medicine and naturopathy. *Journal of Alternative and Complementary Medicine*, 12(3), 323–327. <https://doi.org/10.1089/acm.2006.12.323>
 14. Prakash, G. (2021, February 5). Thriving through thyroid. *Indian Express*. Jindal Naturecure Institute. <https://jindalnaturecure.in/thriving-through-thyroid/>
 15. Karishma, S., Anup, B. T., & Prajapati, P. K. (n.d.). Efficacy of Triphaladya guggulu and Punarnavadi kashaya in the management of hypothyroidism. *Journal of Ayurveda Case Reports*.
 16. Smruthi, K. K. (2023). Hyperthyroidism and its management with Ayurveda: A case report. *Aryavaidyan*, 36(4) & 37(1), 51–54.
 17. Vigneshwar, R., Arivalagan, A., & Palanivel, M. (2021). Thyrogenic, hypolipidemic and antioxidant effects of *Bacopa monnieri* (Brahmi) on experimental hypothyroidism in rats. *Journal of Pharmacognosy and Phytochemistry*, 10(1), 454–458.
 18. Wadhwa, B., & Singh, A. (n.d.). Management of overt hypothyroidism with homoeopathic medicine Iodium: An evidence-based case report. [Journal name not available]. Research Institute for Homoeopathy, Noida, Uttar Pradesh, India.
 19. Kaplan, D., & Dasouki, C. (2021). Two cases of Graves' hyperthyroidism treated with homeopathic remedies containing herbal extracts from *Lycopus* (bugleweed) spp. and *Melissa officinalis* (lemon balm). *Journal of the Endocrine Society*, 5(Suppl. 1), A971.
 20. Kiruthiga, S. (2018). Homoeopathic thyroidinum 3X—An adjuvant in the treatment of hypothyroidism. *International Journal of Complementary & Alternative Medicine*, 11(1), 1–4.
<https://doi.org/10.15406/ijcam.2018.11.00346>
 21. Islam, N., Kauncer, & Bukhari, B. (2011). To evaluate the safety and efficacy of a Unani formulation in Iktisabi Qillat-E-Ifray-E-Darqia (autoimmune hypothyroidism)—A pilot clinical study (pp. 1–6).
 22. Baishya, A., & Metri, K. (2024). Effects of yoga on hypothyroidism: A systematic review. *Journal of Ayurveda and Integrative Medicine*, 15, 100891.
<https://doi.org/10.1016/j.jaim.2023.100891>
 23. Sunitha, M., Shilpa, D., Reddy, K. S., & Bri, S. V. (2023). A study on effect of yoga on thyroid hormonal profile in middle aged women. *Journal of Applied Medical Pharma*, 2023(5), 89–91. <https://doi.org/10.47000/jamp.2023.5.c.19>
 24. Bhandari, R. B., & Mahto, P. K. (2025). Effect of yoga therapy on hypothyroidism: A systematic review. *Annals of Neurosciences*, 32(2), 207–218.
<https://doi.org/10.1177/09727531241282516>
 25. Nair, R., Chawla, R., Sood, V. R., Roy, B. K., & Mukherjee, S. (2021). Efficacy of yoga in controlling subclinical hypothyroidism: A randomized controlled trial. *International Journal of Clinical Trials*, 8(2), 156–162. <https://doi.org/10.18203/2349-3259.ijct20211464>
 26. Tokle, S. R. (2021). A clinico-comparative study on the effect of Lashuna Siddha Tailpana Poorvak Vamana Karma and Nitya Virechana by Gomutra Haritaki in the management of hypothyroidism. *International Journal of Research in Ayurveda and Pharmacy*, 12(4), 49–55. <https://doi.org/10.7897/2277-4343.1204105>
 27. Priya, A., Merlin Kumari, H. V., Mohan, S., & Muthukumar, N. J. (2019). Cross-sectional study on body constitution in Kuraiveethana Noi (hypothyroidism). *International Journal of Advanced Research*, 7(10), 714–721. <https://doi.org/10.21474/IJAR01/9883>