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Therapeutic impact of scientific pranayama on hypothyroidism and overall health

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Abstract - *Hypothyroidism is a prevalent endocrine disorder with significant global and national health impact. Conventional therapies remain central to management, yet complementary practices such as pranayama are increasingly investigated for their potential role in endocrine regulation. This study assessed the effect of structured scientific pranayama on thyroid function and clinical symptoms in 12 women with hypothyroidism over one month. Baseline thyroid-stimulating hormone (TSH) levels ranged from 5.25 to 14 mIU/L, with common symptoms including fatigue, weight gain, hair loss, and menstrual irregularities. Following tailored pranayama protocols, most participants demonstrated a reduction in TSH values, with several achieving near-normal levels. Symptomatic improvements were also reported, including enhanced energy, sleep quality, and overall wellbeing. These findings suggest that pranayama may beneficially influence thyroid regulation through autonomic modulation and stress reduction. While limited by small sample size and short duration, the results support pranayama as a safe, cost- effective adjunct in hypothyroidism management, warranting larger controlled trials*

1. INTRODUCTION

Thyroid disorders are among the most common endocrine abnormalities globally, affecting metabolic homeostasis and quality of life. Thyroid dysfunction includes both hypothyroidism and hyperthyroidism and can result from autoimmune disease, iodine imbalance, or other environmental and genetic factors. Globally, thyroid disorders contribute substantially to the burden of chronic disease, with hypothyroidism and hyperthyroidism observed across diverse populations. **An estimated 200 to 700 million people worldwide suffer from some form of thyroid disorder** [1].

In India, the burden of thyroid disorders is significant and rising, reflecting patterns observed in global epidemiology. Epidemiological studies estimate that approximately 42 million people in India are affected by thyroid diseases, with hypothyroidism being the predominant form [2].

Despite advances in conventional therapy, including hormone replacement and anti-thyroid medications, there remains interest in complementary interventions that may modulate endocrine function and improve patient outcomes. Mind–body practices such as yoga and, in particular, Pranayama have gained attention for their potential influence on autonomic function, stress reduction, and endocrine modulation. A recent systematic analysis of yoga interventions in thyroid disease reported trends toward improved balance in thyroid hormone levels, reduced psychological distress, and enhanced quality of life among thyroid patients [3].

Pranayama, when practiced systematically under scientific protocols, can influence physiological systems through modulation of autonomic tone, hypothalamus–pituitary–endocrine interactions, and stress response pathways, all of which are relevant to thyroid homeostasis. The aim of this study is to evaluate the therapeutic impact of scientific pranayama practice on thyroid disorders, with specific reference to their effect on thyroid hormone levels, clinical symptoms and overall wellbeing of affected individual.

1.1 Objective

1. To compare thyroid function parameter before and after a structured pranayama intervention.
2. To assess the impact of pranayama on clinical symptoms associated with thyroid disorders.

1.2 Methodology

- Type of sampling; universal sampling.
- Duration: 1 month
- Inclusion criteria: Any person with altered serum thyroid hormone levels.
- Exclusion criteria: Children below 12 years, Pregnant women.
- Procedure: 12 people with hypothyroidism were selected. Their serum TSH was tested and symptoms were noted before starting the therapy. Based on their existing comorbidities the Ashta-pranayama was modified and was given as therapy for a duration of 1 month and was followed regularly. The result of therapy is assessed by noting the serum TSH level and improvement in their symptoms.

1.3 Therapeutic Methodology

The following considerations were made regarding the patients and then a comprehensive pranayama therapy course was recommended to them:

- All patients were asked to meditate for 5 minutes in the beginning.
- For a person with only thyroid issues:
  - 5 to 10 mins of Bhastrika
  - 10 mins of Kapalbhati
  - 10 times of Bahya Kumbhaka
  - 21 repetitions of Ujjayi
  - 10-15 mins of Anuloma Viloma
  - 10 times of Bhramari
  - 21 times of Udgeetha
  - Minimum 5 mins of Pranava
- During the evenings – mostly it was Ujjayi(21 times), Anuloma Viloma(10 mins) and Pranava(5 mins)
- For people with High/Low blood pressure, they were asked to avoid Kumbhaka.
- If the patient suffered from stomach issues, Bahya Kumbhaka and Kapalbhati is to be avoided.
- Overall, the recommended sequences and duration was altered based on the co-morbidities of the patients if any.

2. RESULTS

A total of 12 women diagnosed with hypothyroidism were enrolled in the study. Among these, 7 patients (58.3%) belonged to reproductive age group, while 5(41.7%) were post-menopausal. The age distribution is given in the table 1 below. Along with hypothyroidism other co-morbidities like diabetes (16.6), hypertension (33.3%), asthma (16.6%) and varicose veins (8.3%) were noticed.

Table -1: age distribution

Age group (in years)	Number of patients
31-40	3
41-50	4

51-60	3
61-70	2

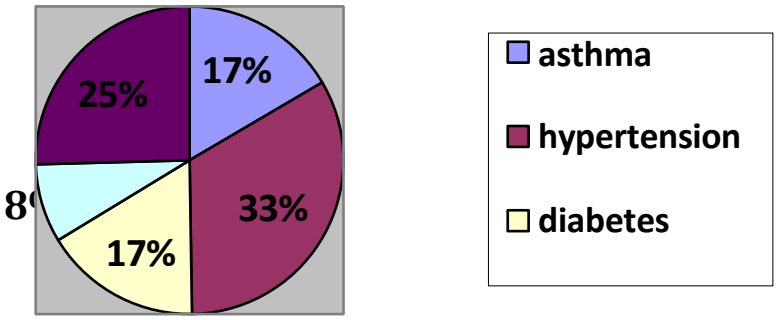

Figure 1: Other co-morbidities

Before beginning the therapy their symptoms were noted which included irregular menstrual cycle (50%), fatigue (41.6%), weight gain (50%), hair-fall (58.3%), reduced appetite (16%) and lack of sleep (12%). Their TSH levels were taken. They were given therapy based on their other condition. After a month their TSH reading was asked. The results are given in table 2 below.

TABLE 2: TSH levels before and after therapy.

Sl. no	Initial reading (mlU/L)	Final reading (mlU/L)
1	9.36	5.52
2	5.25	3.25
3	8	5.1
4	6.2	4.9
5	5.2	4.12
6	6.38	0.9
7	6	2.1
8	5.5	5.7
9	14	8
10	7.2	4.81
11	6.8	5.9
12	5.98	4.4

Baseline TSH Levels

At baseline, the TSH values ranged from 5.25 to 14 mIU/L, indicating that the majority of participants had elevated TSH levels suggestive of hypothyroidism or subclinical hypothyroidism. Several subjects showed markedly raised values (>10 mIU/L), reflecting poor thyroid function at the start of the study.

Post-intervention TSH Levels

- Following the regular practice of scientific pranayama, a reduction in TSH levels was observed in most subjects. Final TSH values ranged from 0.9 to 8 mIU/L. Notably:
- Subjects with very high baseline TSH levels (e.g., 14, 9.36, 8 mIU/L) demonstrated a substantial decline in post-intervention readings.
- Some participants achieved near-normal or normal TSH values, indicating improvement in thyroid regulation.
- A few subjects showed mild or minimal changes; however, the overall trend was toward reduction.

Overall Findings

Comparison of initial and final TSH values demonstrates a consistent downward trend across the majority of participants. This suggests that regular scientific pranayama practice may have a beneficial modulatory effect on thyroid function, possibly through mechanisms involving stress reduction, autonomic balance, and neuroendocrine regulation.

3. CONCLUSIONS

The present study evaluated the therapeutic impact of scientific pranayama on thyroid function in women diagnosed with hypothyroidism. The findings demonstrate that regular, structured pranayama practice over a one-month period was associated with a significant improvement in serum TSH levels in the majority of participants. In addition to biochemical improvement, participants reported notable relief in clinical symptoms such as fatigue, lethargy, sleep disturbances, body aches, and overall wellbeing. The improvement was observed across different age groups and irrespective of the presence of associated co-morbidities, indicating a broad beneficial effect of pranayama. The observed reduction in TSH levels may be attributed to pranayama's role in modulating autonomic nervous system activity, reducing stress, and influencing the hypothalamic–pituitary– thyroid axis, thereby promoting endocrine balance.
Although the study was limited by a small sample size and short duration, the results suggest that scientific pranayama can serve as a safe, cost-effective, and complementary therapeutic intervention in the management of hypothyroidism. Larger, long-term randomized controlled studies are recommended to further validate these findings and to establish standardized pranayama protocols for thyroid disorders

Mechanism of Pranayama

Mechanism of Therapeutic Scientific Pranayama
• Bhastrika: Due to snoring sound/vibrations, heat is produced in the throat
region. This provides a soothing effect due to heat energy. Releases Nitric oxide, boost immunity. Working principle – Pascal's law, Boyle's law.
• Ujjayi: Due to half constricted windpipe during jalandara Bandha (chin lock),
sound vibration/snoring sound/heat is produced because of the friction. Heat treatment on the throat region. Psychological effect plays prominent role. Working principle – Venturi Effect
• Anuloma-Viloma: Affects parasympathetic nervous system. Working Principle – Boyle's Law, Henry's Law, Bernoulli's Principle
• Bhramari: Effects same as Bhastrika

DEFINITIONS

- Pascal's Law: Pressure applied to a confined fluid is transmitted equally in all directions.
- Boyle's Law: The volume of a gas is inversely proportional to its pressure at constant temperature.
- Venturi Effect: Fluid velocity increases while pressure decreases when passing through a constricted section of

a pipe.

- Henry's Law: The amount of gas dissolved in a liquid is proportional to its partial pressure above the liquid.
- Bernoulli's Principle: As the speed of a fluid increases, its pressure decrease

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