I alone persist: Blissful: Absolute.

YOGA-MĪMĀṂŚĀ

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July 2011

Vol. XLIII No. 2

KAIVALYADHAMA

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Surely Health is the primary requisite of spiritual life.
EFFECT OF YOGA ON SUBCLINICAL HYPOTHYROIDISM:
A CASE REPORT
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ABSTRACT

Complementary and Alternative Medical (CAM) therapies such as yoga are being increasingly used as adjuncts to modern medicine. Though it has been suggested that yoga may have a role in revitalizing thyroid function there are few studies on the effects of yoga on thyroid disorders.

Case history: A 36 year old female with elevated TSH level (9.39 IU/ml) and low normal T4 levels (12.57 pmol/L) was diagnosed as having primary sub-clinical hypothyroidism and advised to start replacement therapy. She came for consultation to the ACYTER Yoga OPD at JIPMER, Pondicherry and was given appropriate yogic counseling and taught a series of techniques potentially beneficial to patients of thyroid conditions. She continued the practices for a year and reported back at the end of the year with her biochemical investigations.

Results: After one year of therapy, there was a fall in TSH (2.66 mIU/L) and a normalization of free T4 values (8.98 pmol/L). A third biochemical analysis three months later showed that TSH further stabilized 2 mIU/L and FT4 at 9.78 pmol/L. As the anti TPO antibodies were positive both before and after the yoga intervention, the patient was advised to continue the yoga practices on a regular basis as long as possible with regular six-monthly follow up.

Conclusion: it is suggested that yoga can be an effective adjunct therapy in thyroid conditions and further studies in larger samples are needed to confirm these findings and to better understand the mechanisms behind such beneficial effects in patients of thyroid disorders.

Key words: Subclinical hypothyroidism, yoga therapy, psycho-neuro-endocrinology

Introduction

In recent times there is a shift in paradigm and Complementary and Alternative Medical (CAM) therapies such as yoga are being increasingly used as adjuncts to modern medicine. It has been suggested that yoga may have a role in revitalizing thyroid function as well as improving psycho-neuro-endocrine function on the whole (James Funderburk 1977, Singh RH 1982). Though

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numerous studies have shown the psycho-physiological benefits and therapeutic potential of Yoga (Khalsa 2004) there are few studies on the effects of yoga on thyroid disorders.

Hypothyroidism refers to a condition where the thyroid gland is not producing sufficient amounts of hormones. As there are intricate feedback mechanisms between the thyroid and anterior pituitary, hypothyroidism is classified as primary when thyroxin (T4) and triiodothyronine (T3) levels are low but levels of thyroid stimulating hormone (TSH) secreted by anterior pituitary high. It is classified as secondary when TSH is low and T4 and T3 levels are high.

Sub-clinical hypothyroidism is a condition where TSH levels are elevated but $T_4$ and $T_3$ levels are usually found to be in the normal laboratory reference ranges. Prevalence in the US adult population ranges from 4 to 8.5% with an increase with age. It is also more common in women. Sub-clinical hypothyroidism may manifest without any major thyroid related symptoms as cellular metabolic rates may not be affected in many cases. Approximately 2 to 5 % of these patients will progress to overt hypothyroidism per year (Martin I Surks 2004). Opinion is divided on the biochemical and symptomatic point at which to start replacement therapy with levothyroxine that is the usual management of clinical hypothyroidism. One needs to be cautious as there is always the risk of iatrogenic hyperthyroidism.

**Case Report**

**History**

A 36 year old female, working in Kuwait presented to her clinician with the complaints of hair fall and a feeling of general lethargy. There were no other major thyroid related symptoms through she was anxious about her condition. As her blood tests revealed an elevated TSH level and low normal T4 levels she was diagnosed as having primary hypothyroidism and advised to start replacement therapy with levothyroxine as she tested positive for anti TPO antibodies. The patient put off starting the medication as she was visiting Pondicherry to visit her father for a short holiday with family. As she wished to avoid lifelong replacement therapy, on the suggestion of her father who is a YOGA enthusiast she came for consultation to the ACYTER Yoga OPD that is functioning since June 2009 at JIPMER, Pondicherry. She had no apparent thyroid enlargement and her vitals were within normal limits. However she was anxious about her condition and the necessity of taking levothyroxine life long. She was given appropriate yogic counseling and dietary advice and taught a series of techniques that are potentially beneficial to patients of thyroid conditions. She continued the practices for one year and reported back at the end of the year with her biochemical investigations. Her biochemical results showed a fall in
TSH and a normalization of free T4 values. She also reported less hair fall and a sense of well being. In fact she commented that many of her colleagues at work had noticed the positive changes in her attitude and day to day activities and were interested in what she has doing so that they could benefit themselves. As the anti TPO antibodies were positive both before and after the yoga intervention, the patient has been advised to continue the yoga practices on a regular basis as long as possible with regular six-monthly follow up.

**Investigations**

The initial biochemical investigations detected that her TSH was 9.39 IU/ml (normal range for the laboratory is given as 0.27 to 4.20 mIU/L) and FT4 value was 12.57 pmol/L which is at the lower normal level of the range for that laboratory (12 to 22 pmol/L). Following 6 months of Yoga therapy, TSH fell to 2.66 mIU/L (normal range for the laboratory is given as 0.37 to 4 mIU/L) while FT4 was 8.98 pmol/L which is mid normal of the range for that laboratory (7.5 to 21 pmol/L). A third biochemical analysis three months later showed that TSH was 2 (normal range for the laboratory 0.27 to 4.20 mIU/L) and FT4 was 9.78 (normal range for the laboratory 7.86 to 14.4 pmol/L). Anti TPO antibodies were positive both before and after the yoga intervention.

**Yoga therapy**

The patient was given appropriate yogic counseling and dietary advice and taught the following techniques that may be potentially beneficial to patients of thyroid conditions. The techniques included sūrya namaskāra, jālandharabandha, viparītakaraṇī and brahmamudrā in addition to āsanas such as trikoṇa, vakra, ardha matsyendra, pawanamukta and sarvaṅgāsana. She also received training in sūryanādi, praṇava, ujjāyi and bhrāmari prāṇāyama and relaxation techniques done in śavāsana.

**Discussion**

The consensus report generated by the Consensus Development Conference (2002) cosponsored by the American Association of Clinical Endocrinologists (AACE), the American Thyroid Association (ATA), and The Endocrine Society (TES), has suggested that the upper limit of TSH should be considered as 4.5 mIU/L. It also states that since available data do not convincingly show clear-cut benefit from early thyroxine therapy, routine T4 treatment for patients with TSH between 4.5 and 10 mIU/L is not warranted. Martin I Surks et al (2004) concluded that data supporting associations of sub-clinical thyroid disease with symptoms or adverse clinical
outcomes or benefits of treatment are few. They have recommended against routine treatment of patients with TSH levels ranging from 4.5-10 mIU/L. as the consequences of sub-clinical thyroid disease are minimal.

However the AACE Clinical Practice Guidelines for the Evaluation and Treatment of Hyperthyroidism and Hypothyroidism (2002 Update) suggests that thyroid antibodies should be measured in patients having sub-clinical hypothyroidism and used as a clinical tool in deciding upon treatment. AACE guidelines also recommend treatment of patients with TSH > 5mIU/L if the patient has a goiter or if thyroid antibodies are present.

Two randomized controlled trials in patients with TSH values less than 10mIU/L found no symptomatic improvement following treatment with thyroxine (Meier C 2001 and Kong WM 2002). However caution is advised as there is a risk of progression to overt hypothyroidism. A 20 year follow up study showed a correlation of this with TSH levels and anti TPO antibodies (Bijay 2008).

Yoga has great potential as an adjunct therapy as it is cost effective and may not have any complications when practiced in a proper manner and under expert guidance. Many patients are nowadays also opting to try out yoga either before starting medications, or in combination with medication. The position statement of the AACE on Sub-clinical Thyroid Disease clearly states that until adequate data are available, best practice combines clinical judgment with patient preferences. In this case, the patient's preference was to use yoga as a method to prevent her sub-clinical hypothyroidism from developing into full blown hypothyroidism and to avoid taking the replacement therapy as long as possible.

Yoga therapy imparted to this patient included techniques that may stimulate the thyroid such as viparitakarani, sarvaṅgāsana and jālandhara bandha. One of the pioneers of reach in Yoga, K. N. Udupa (1985) of the BHU, Varanasi reported that head-low posture reduced levels of circulating catecholamine, improved tolerance to stress hence may act as a tranquilizer. These practices may help normalize thyroid function and also improve neuro-endocrine feedback mechanisms. This may also be accentuated by the prāṇāyāma practices like bhrāmari and praṇāva that may bring about such benefit through central action on either the hypothalamus or the limbic cortex.

Forfar et al (1982) reported a reduction in left ventricular ejection fraction and myocardial contractile performance in hypothyroid patients. A study of systolic time intervals in hypothyroid patients by William F. Crowley et al (1977) reported that pretreatment systolic time intervals
were characterized by prolongation of the pre-ejection period and reduction of left ventricular ejection period. A previous study from our laboratory has demonstrated that three months of prānāyāma training modulates ventricular performance by increasing parasympathetic activity and decreasing sympathetic activity (Udupa 2003).

The practice of yoga is known to elude a sense of subjective well (Malathii) and a study done at the Integral Health Clinic of AIIMS, New Delhi reported that state and trait anxiety scores were significantly reduced following a comprehensive but brief lifestyle intervention based on yoga. Subjects in that study included patients of thyroid disorders (Gupta N 2006). Yogic relaxation techniques may be producing psycho-somatic harmonization and inducing a sense of calm due to hypo-metabolic activity as has been described in meditation by RK Wallace (1971). A reduction in metabolic activity could be indirectly reducing the bodily demand for thyroxin as demonstrated by S. B. Rawal and colleagues (1994).

Further studies in larger samples are needed to confirm these findings and to better understand the mechanisms behind such beneficial effects of yoga in patients of thyroid disorders.

References


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Authors' Note

The authors thank Mrs. Lalitha Shanmugam for imparting the Yoga Therapy at the Yoganjali Natyalayam city centre of ICYER, Pondicherry. We also thank the Director, MDNIY and Director, JIPMER for their support as this study was possible only because ACYTER has been established as a collaborative venture between the Morarji Desai National Institute of Yoga, New Delhi and JIPMER, Puducherry with funding from Department of AYUSH in the Ministry of Health and Family Welfare, Government of India.