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Original Research Article

A STUDY ON EFFECT OF YOGA ON THYROID HORMONAL PROFILE IN MIDDLE AGED WOMEN

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Abstract

Background: Hypothyroidism, a thyroid disorder is more common in females and refers to an under active thyroid gland, whereby the thyroid gland can not make enough thyroid hormone to maintain homeostatisis in the body. Low thyroid hormone levels cause metabolic functions to slow down, resulting in a general symptomology that can include dry skin, fatigue, loss of energy, weight gain, depression ormemory problems. Yoga is an excellent form of health care management that is well suited to the needs of thyroid patients. Before the development of Western Medical science, Yogis believed that the neuroendocrine system was vital to health and a set of practices were devised in order to maintain healthy glands and the body's metabolism. **Materials and Methods:** The present study included 50 mid aged women aged between 35-50 years. The subjects were practiced yoga for 6 months, the yoga practice includes Asana, Praṇayama and Yoganidra for one hour weekly minimum four days per week for 24 weeks, usually morning sessions 7 to 8 am period was selected for yoga. We have measured the Triiodothyronine (T3), Thyroxine (T4) and Thyroid-stimulating hormone (TSH) pre and post study. **Result:** The middle aged women aged between 35-50 years were involed in study for 6 months, pre and post thyroid blood hormone levels were measured. Before the study T3 level was 135+8.96 ug/dL, after study it was 152+12.62 ug/dL, T4 level was before the study was 6.3+0.82ug/dL and after study was 7.5+1.23 ug/dL, TSH level was before study 3.72+0.92 U/mL and after the study was 4.95+1.56 U/mL and P-value was statistically significant(<0.05) in T3 and T4 values. **Conclusion:** Our study concluded that yoga is helping the maintenance of good levels of thyroid hormones. Yoga may be considered as supportive or complementary therapy in conjunction with medical therapy for the treatment of thyroid disorders.

INTRODUCTION

The thyroid gland is an endocrine gland that has two lobes connected with the thyroid isthmus. It is located in the anterior part of the neck around the trachea. It releases thyroid hormones tri idothyronine (T3), tetraidothyronine (T4), and calcitonin, which are released directly in the bloodstream and carried to every tissue in the body. The thyroid hormones are essential for growth and development, for the nervous system, metabolism, and organ functions. It influences the functioning of all organ systems and functions throughout the lifetime. Normal value in adult for thyroid stimulating hormone (TSH) is 0.4–4.0 mlU/L, for total T3 is 80−220 ng/dL, and for total T4 is 5.4–11.5 mcg/dL. The production of thyroid hormone is regulated by TSH which is released from the anterior pituitary. The TSH production itself is regulated by the thyrotropin releasing hormone. Common thyroid diseases or disorders are: hypothyroidism, hyperthyroidism, thyroid cancer, Graves' disease, and polar T3 syndrome. Thyroid disorders are also seen in the case of perimenopausal women and menstrual abnormalities in females of reproductive age. Thyroid function is also disturbed in people who are exposed to high altitudes. In general, along with other systems of the body, the endocrine system is also affected by the normal aging process, exposure to high altitudes, and severe temperature changes.[1] Hypothyroidism is highly prevalent among women. The overall prevalence of hypothyroidism in India is 10%, whereas its prevalence in Indian women is 15.8%.[1] In study of Deokar et al. (2014) subjects were with with suspicion of hypothyroidism and reported a 9.4% prevalence of subclinical hypothyroidism and a 4.2% prevalence of overt hypothyroidism. Hypothyroidism in women contributes to infertility, menstrual

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disorders, cardiovascular disease, type 2 diabetes mellitus and psychiatric disorders.[2-4]

In India, as well as in many Western countries, various forms of Yoga are practiced as a means of improving overall health. In the main, yoga represents a set of principles and practices designed to promote health and well being through the integration of body, breath and mind. The efficacy of yogic practices have also been explored for therapeutic use in certain psychosomatic disorders. Yoga is probably the most effective way to deal with various psychosomatic disabilities. It has been reported that physiological changes occurring during certain psychosomatic disorders can be regulated following continuous practice of Shavasana.

Yoga is an excellent form of health care management that is well suited to the needs of thyroid patients. Before the development of Western Medical science, Yogis believed that the neuroendocrine system was vital to health and a set of practices were devised in order to maintain healthy glands and the body's metabolism. As a result, several poses are designed to work directly on the thyroid gland with the aim of regulating its function and hormonal release. Careful yoga therapy can act as a valuable complement to the treatment of thyroid problems. Gentle stretching exercises emphasizing breathing awareness can assist in reducing stress levels and increase muscle flexibility resulting in a reduction in muscle and joint stiffness.[5]

A good number of research articles are published on the effect of the transcendental meditation program on the hormonal level. After practicing transcendental meditation for 4 months, the level of cortisol and TSH were decreased, whereas there was an increase in growth hormone.[1,6] A researcher also found an increase in alpha waves and a significant decrease in serum cortisol during the practice of Yoga.[1,7] In a study, scientists found a significant improvement in systolic blood pressure (BP), body mass index and high density lipid cholesterol, heart rate, body weight, diastolic BP, total cholesterol, triglycerides after regular practice of Yoga.[1,8] Studies conducted by scientists found that irrespective of gender and BMI, regular pranayama and meditation practice for 15 days can result in a convincing decrease in systolic BP, diastolic BP, and mean arterial BP. A decrease in resting pulse rate was also noted.[1,9,10] Another study, an effect of Santhi Kriya on certain psychophysiological parameters found an increased alpha wave activity.[1,11] A study was conducted to evaluate the effect of sukha pranayama: A slow and deep breathing technique on maternal and fetal cardiovascular parameters found when done with 6 breaths/min for as less as 10 min is good for high BP and pregnant ladies as it shifts the autonomic balance toward parasympathetic, increases vagal modulation, improves baroreflex sensitivity.[1,12]

A study found yoga group following eight weeks of hath Yoga showed significantly greater improvement on the executive function's measures of working memory, shorter reaction time, and greater accuracy.[13] Scientists found 16 weeks of Bikram Yoga significantly improved perceived stress, general self efficacy, and health related quality of life in sedentary, stressed adults.[14] A study found that the students, who practiced Yoga performed better in academics as Yoga helps to decrease stress. It was also found that with lower stress students were able to function in an improved way than those with a higher level of stress.[15] Scientists found a significant increase in left ventricular ejection fraction after 12 weeks of practice of pranayama and meditation.[16] The present study was conducted to study effect of Yoga on thyroid hormones.

MATERIALS AND METHODS

The present study was conducted in the various medical institutions in Karnataka. The purpose of present study to study the effect of Yoga on thyroid function test in middle aged women. Total 50 women aged between 35-50 were selected for the study, they have involved in study voluntarily. The practices in Yoga such as Yogic practices include, Asana, Praṇayama and Yoganidra for one hour weekly minimum four days per week for 24 weeks, usually morning sessions 7 to 8 am period was selected for yoga. We have measured the Triiodothyronine (T3), Thyroxine (T4) and Thyroid-stimulating hormone (TSH) pre study and post study.

During yoga period we had given to the subjects one hour yoga which included warm-ups, suryanamaskar, and asanas in positions of standing, sitting, supine, and prone. Each position included three different asanas one of which was meant for relaxation to the subjects, also to let them get ready for the next position without any stress. These were followed by Pranayama and Omkar. Asana like - Svastikasana, Tadasana-I, Tadasana-II, Vajrasana, Supta Vajra, Trikonasana, Parsvakona, Pascimottanasana, Purvottaadsana, Pavanamukta, Bhujangasana, Yoga Mudrasana, Ustrasana, Janusirsasana, Matsyendrasana, Uttanapada, Viparitakarani Mudra Halasana. Praṇayama like - Ujjayi, Anuloma - Viloma, Bhastrika. Ajapajapa Meditation and Yoganidra - a deep relaxation technique.

RESULTS

The present study was conducted with total 50 women aged between 35-50 were selected for the study, they have involved in study voluntary. The study was conducted for minimum 1 hour, 4 days per week for 24 weeks. We have measured the thyroid hormones such as T3, T4, TSH before conducting the study and after the study. The present study shown good improvement and balance in thyroid hormones significantly and maintained good balance in thyroid hormones, which indicates yoga having good effect in maintaining good levels of thyroid hormones,

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which indicates yoga maintain good health in women of mid aged [Table 1].

Table 1: Showing the Thyroid Profile Hormones levels before and after study

	T3 (60 - 200 ug/dL) Mean+SD	T4 (4.5 -11.5 ug/dL) Mean+SD	TSH (0.3-5.0 U/mL) Mean+SD
Before Study	135+8.96	6.3+0.82	3.72+0.92
After Study	152+12.62	7.5+1.23	4.95+1.56
P – Value	<0.05	<0.05	>0.05

DISCUSSION

Yoga is an alternative system of healing, its power being widely harnessed to prevent and treat thyroid gland dysfunction. Yoga is undoubtedly a reliable avenue for holistic health. Yoga not only serve as a helpful therapy in relieving existing symptoms, but also act in the management of hypothyroidism and prevention of further damage to thyroid gland. Many of the thyroid disorders occur due to excessive stress. Yoga can help alleviate stress and anxiety to a great extent. This practice is also useful in maintaining the right balance between the mind and the body.[17,18]

TSH secreted by the pituitary gland regulates the synthesis and the secretion of T3 and T4. Thyroid hormones are important regulators of energy metabolism and may influence energy processes during physical exercise. The function of T3 and T4 includes increasing the rate of the metabolism of carbohydrates and fats, as well as the synthesis and degradation of proteins inside the cell.[19] The present study was conducted to find the effect of yoga on thyroid hormones in middle aged women.

We have done blood thyroid hormone levels pre and post study. Pre study T3 level was 135+8.96 ug/dL, post study it was 152+12.62 ug/dL, T4 level was pre study it was 6.3+0.82ug/dL and after study was 7.5+1.23 ug/dL, TSH level was before study was 3.72+0.92 U/mL and after the study was 4.95+1.56 U/mL and P value was statistically significant (<0.05) in T3 and T4 values.

In study of Azam Salehi,[18] results indicated that T3 decreases significantly in the control group, however, there was no significant change in T4 and TSH in any of the two groups over the 8 weeks period. They concluded that yoga training utilized in this study had not significant effect on thyroid function in sedentary women. In studies of Werner et al,[20] and Maclean et al,[6] reported that transcendental meditation had no significant effected on T3 and T4 level. In study of Gorden et al. also, reported that there is no significant change in TSH, T3 and T4 level after the practice of yoga.[21]

In study of Chatterjee and Mondal, reported that twelve weeks of yogic training produces a significant increase in serum TSH level for male and decrease in T3 and T4 for both male and female groups as compared to their baseline data, whereas no such changes were observed in the control group during these 12 weeks. These discrepant results may be attributed to differences in subject populations and yoga training duration. In the same study noted that transcendental meditation gives rise to a unique state of deep rest by marked reductions in resting heart rate, respiratory rate, oxygen consumption, metabolic activity, increased cerebral blood flow may responsible for the decrease of serum TSH in the human body. In their study they included suryanamaskara, shitilikarana practices and asanas which were reported as moderate aerobic type of exercises may positively increased the basal level of TSH and decreased T3 and T4 levels in the plasma blood and they also stated that regular practice of pranayama and meditation may send a positive feedback to the hypothalamus and pituitary.[22] According to Bansal A et al regular exercising increases metabolic activity, this helps burn more calories and helps keep weight down. In their study it is observed that medium-intensity aerobic exercise, which the study classified as 70% of a person's maximum heart rate, produced the best results for improving TSH. They summarised in their study can by itself improve thyroid function may be through better perfusion of gland.[23,24] The present study concluded that the practice of Yoga, may improve and balance the thyroid hormonal profile in middle aged women. Yogic practices brought hormone balance in the body. It is evident that the Yogic practices could be used to improve the health of any Individual.

CONCLUSION

Our study concluded that yoga is helping the maintenance of good levels of thyroid hormones. Yoga may be considered as supportive or complementary therapy in conjunction with medical therapy for the treatment of thyroid disorders.

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