

TO ASSESS THE EFFICACY OF YOGA AND DIET INTERVENTION IN HYPOTHYROID INDUCED OBESITY

¹Dr. Sunita Jain ²Dr. Suresh Babu ³Dr Vibha Pali

¹Govt. Ayurved College Raipur (CG), ²Department of Sleep Medicine Anvesana Research Laboratories S-VYASA University, Bangalore ³Department of Swasthavritta, Govt. Ayurved College, Raipur, (Chhattisgarh)

ABSTRACT

Hypothyroidism is observed to be associated with obesity, decreased metabolic rate, physical activity, mood alteration and mental emotional changes. Yoga acts an effective tool in dealing with physical, mental, emotional and spiritual aspects of life. This is a comparative study of 60 patients, where, 30 patients were given Diet group (A) and 30 patients were followed by yoga and diet (B) group. 1st day yoga demonstration and diet chart explained clearly and later yoga class was taken through online mode. After 2 months intervention, variable were assessed. Data analysis was done using Paired sample t-test and independent sample t test. Both the groups showed equally effective and highly significant in tiredness, irregular menstruation, dry skin, joint stiffness, hoarseness of voice, weight, hair fall, body mass index Group A showed significant in poor appetite, serum T3, sleep disturbance and Pittsburgh sleep quality index test and Group B showed significant in waist hip ratio, mid arm circumference, serum thyroid stimulating hormone and perceived stress scale. The study revealed both interventions were equally effective in management of hypothyroid induced obesity. Variables exhibited had similar effect on both groups, whereas significant change was observed in perceived stress, waist hip ratio and body weight in B group.

KEYWORDS: Yoga, diet, hypothyroidism, obesity

INTRODUCTION

Prevalence of chronic non-communicable diseases is increasing among the adult population due to change in life style & behavior patterns of the people which are favorable for the occurrences of chronic non-communicable diseases (51.1%) Diabetes Mellitus, Hypothyroidism, Hypertension, Cancer, Ischemic Heart diseases, Atherosclerosis, Varicose Veins etc. are recognized as major Non-Communicable diseases for which *Sthoulya* (obesity) is traced to be a major risk factor. Overweight

and obesity are the 5th leading risk factor of death worldwide. During the last few decades obesity (defined as body mass index >/30 kg/m²) has become a major health concern, mainly in developed countries¹.

Factor responsible for obesity is mostly caused by a combination of over eating, lack of physical activity and genetic susceptibility². A few cases are caused primarily by genes, endocrine disorder, Cushing syndrome, Hypothyroidism, Polycystic Ovarian syndrome, hormone

replacement therapy or mental illness³. Obesity and hypothyroidism are 2 common clinical conditions that have been linked together closely⁴. Obesity is generally regarded as being secondary to thyroid dysfunction. Hypothyroidism is associated with decreased thermo genesis, decreased metabolic rate and has also been shown to correlate with a higher body mass index (BMI) and higher prevalence of obesity⁵. Alongside a chance association, a strong relationship between “Thyroid & Obesity” has been hypothesized⁶. Thyroid hormone is indeed an important determinant of energy expenditure especially during regimens of dietary restriction⁷.

Thyroid diseases are the leading endocrine problem worldwide. About 300 million people are suffering from thyroid disorder worldwide. It has been estimated that about 42 million people in India suffer from thyroid disease⁸. The prevalence of Hypothyroidism was high, affecting approximately one in ten adults in the study population⁹. Females and old age were found to have significant association with hypothyroidism.

Recent studies have reported that globally more than 1.9 billion adults are overweight and 650 million adults are obese¹⁰. Approximately 2.8 million deaths are reported as a result of being overweight or obese. In India more than 135 million individual were affected by obesity¹¹.

OBJECTIVES

To compare and assess the efficacy of integrated approach of yoga therapy and diet intervention in hypothyroid induced obesity.

METHODOLOGY

INCLUSION CRITERIA-

- BMI more than 25 and less than 42

- Between 20 to 55 years of age
- Those who has diagnosed with hypothyroidism with normal or increased TSH
- Overweight and obesity
- Subject who were willing to participate
- Who are physically able to practice yoga

EXCLUSION CRITERIA –

- Below 20 yrs and above 55 yrs
- Association of other severe co-morbidities e.g. Heart disease renal disease or any infectious diseases etc.
- Subject unwilling to participate.
- Subject taking psychiatrics, cardiac or renal medication.
- No previous history of hospitalization or surgery in last 6 months.

ASSESSMENT

1. Subjective criteria

Psychological – Perceived stress scale
Pittsburgh sleep quality index score

Symptomology criteria – tiredness, irregular menstruation, dry skin, joint pain, hoarseness of voice, poor appetite, weight gain and hair fall measured through Likert scale.

2. Objective criteria

Anthropometric measurement-
weight (in kgs)
height (in cms)
body mass index
waist hip circumference
mid arm circumference

3. Haematology – Thyroid profile – to assess the thyroid hormone T3, T4, TSH.

9 INTERVENTION

5.4.1 Integrated approach of yoga therapy

-Dynamic asana along with loosening and breathing techniques and Deep Relaxation Technique.

-1 hour of yoga practice inclusive of Deep Relaxation Technique, 6 days per week for 2 months is given.

-Following are some dynamic practices that increase their flexibility also.

TABLE NO. 1 Showing the yoga practices

Loosening Exercise	Rounds
Jogging (all sides)	40 to 100
Sideward bending	10
Twisting with legs apart	10
Toe touching	10
Heel touching	10
Swimming	10
Hip rotation	10
Knee rotation	10
Back swing	10
Surya namaskar	12 to 18
Pavanmuktasana kriya both sides	5
Rocking and rolling	5
Alternate knee touching	10
Lumbar stretch	5
Quick relaxation technique	2 mins
Butterfly	10
Ardh padmāsana swing	10
Bhunasana	10
Paschimottanasana and halasana swing	10
Bhujāṅgāsana , śalabhāsana swing	10
Dhanurasana swinging	10
Naukasana swing	10
Salamba śalabhāsana	10
Navasana	10
Straight leg raising	10
Side leg raising	10
Cycling forward and backward	15
Bhujāṅgāsana and parvatasana swing	10

Vakrasana	10
Tiger stretch back stretch	10
Side stretch	10
Free walk baby walk crow walk	10
Step climbing	10
diagonal jump	10
spinal twist (with legs together) jumping	20
DRT	10 mins

Asana that compress and stretch the throat area are beneficial to thyroid and helpful both for hyper and hypothyroidism as they stimulate the blood flow, which provides nourishment to the cells and helps in proper functional activity of thyroid gland

So along with above list of practice some asanas like Matsyasana, sarvangasana, bhujāṅgāsana, halasana, simhasana, kapālabhāti kriya Nadishodhana pranayama, ujjayi pranayama etc. are very beneficial for hypothyroidism. Repetition can be increased gradually.

Advanced meditation technique like MSRT, Cyclic meditation, bhajan, mantra chanting was also practiced.

Dietary management

-Low calorie, high fibre and anti-Goitrogenic diet advised.

-500 kcal less than ideal calorie requirement.

-Fasting once a week on fruit.

-Freely intake of – salad, green vegetable, seasonal fruit, pineapple, vit C rich fruit, Whole grain, ragi, bajra, oats, sprouts and unpolished grain preferred

-Less intake of- deep fried items, sweet sugar, jelly, jams, all refined products like Maida cauliflower, cabbage, broccoli, soybean, etc Goitrogenic food should be avoided.

TABLE NO.2 Showing the Diet Chart

Time	Diet advised
7:00-7:30(AM)	Coriander seed (1tsp) +

	Jeera (1tsp) Soaked overnight in 1 glass of water & make decoction in Morning...		+honey 1 tsp) + 1 Seasonal fruits (Watermelon, Pineapple, apple, Pears, Jamun)
8:30-9:30(AM) Breakfast	Vegetable Upma 1 plate / vegetable Dalia bowl/ sprouted salad 1 plate / oats chila or stuffed roti with green chutney / Rava Idly 3-4 with sambhar / Fruits 200 gms.	07:30-08:00(PM)	2 Roti + 1 katori sabji + 1 katori Dal / appe 6-7 pc + green Chutney / oats vegetable dalia/ makhana or corn or puffedRice vegetable bhel+ 1 bowl soup / 200 gms fruit + soup 1 bowl
11:30-12:30(PM) (Before Lunch)	Salad (cucumber, tomato, carrot, beat etc) 150 gms	10:00(PM)	150 ml milk (cow milk without cream) + turmeric 1/4 th teaspoon + Dry ginger powder half tea spoon.
12:30-01:30(PM) (Lunch)	2 Roti (Ragi/oats/wheat (sometimes) +1/2 katori rice if needed +1 katori moong dal + 1 (Lunch) katori Green vegetables + 1 katori curd or buttermilk + 1tsp flax seed		
04:00:05:00(PM)	Herbal Tea (Tulsi, mint, ginger, lemon grass		

TABLE NO.3 Showing the Results

RESULT

Data analysis was done using excel sheet and statistical analysis done using software SPSS version -20. Paired sample t-test or Wilcoxon signed rank test used for within group analysis and independent sample t test for between group analyses.

S. No.	Variable	Group A (diet)				Group B (Yoga& Diet)				Between
		Pre	Post	% Change	P value	Pre	Post	% Change	P value	n
1.	Tiredness	3.27± 0.91	2.37± 0.96	27.52	0.00**	2.87± 1.20	1.83± 1.09	36.24	0.00**	0.50
2.	Irregular menstruation	1.10± 1.45	0.67± 0.96	39.09	0.00**	1.10± 1.65	0.70± 1.09	36.36	0.00**	0.84
3.	Dry Skin	1.30± 1.32	1.00± 1.08	23.08	0.01*	1.80± 1.67	1.17± 1.23	35.00	0.00**	0.09
4.	Joint stiffness	1.93± 1.28	1.13± 0.97	41.45	0.00**	1.50± 1.48	1.00± 1.02	33.33	0.00**	0.11

5.	Hoarseness voice	1.27± 1.20	0.70± 0.79	44.88	0.00**	1.07± 1.28	0.63± 0.76	41.12	0.00**	0.45
6.	Swelling	0.70± 0.99	0.30± 0.53	57.14	0.00**	0.87± 1.33	0.67± 0.96	22.99	0.03*	0.17
7.	Poor appetite	0.63± 0.93	0.33± 0.61	47.62	0.01*	0.47± 0.82	0.30± 0.60	36.17	0.06	0.31
8.	Hair fall	0.67± 1.18	0.37± 0.81	44.78	0.0**	1.10± 1.42	0.57± 0.82	48.18	0.00**	0.16
9.	Weight	74.69± 11.76	73.42± 11.66	1.70	0.00**	76.00± 13.27	74.00 ± 12.92	2.63	0.00**	0.01*
10.	BMI	29.56± 4.19	29.01± 4.18	1.86	0.00**	31.26± 4.58	29.13 ± 6.92	6.81	0.02*	0.06
11.	Waist hip ratio	0.80± 0.05	0.79± 0.05	1.25	0.18	0.79± 0.06	0.76± 0.06	3.80	0.00**	0.16
12.	Mid arm circumference	13.22± 1.59	13.09± 1.54	0.98	0.09	12.96± 1.52	12.73 ± 1.36	1.77	0.00**	0.39
13.	Serum T3	106.43 ± 20.12	100.74 ± 21.03	5.35	0.02*	114.39 ± 32.01	111.8 3± 27.30	2.24	0.51	0.27
14.	Serum T4	8.17± 1.47	8.35± 1.23	-2.20	0.16	7.19± 1.84	7.36± 1.43	-2.36	0.22	0.26
15.	Serum TSH	6.81± 5.48	5.92± 4.30	13.07	0.01*	5.94± 4.69	5.19± 3.83	12.63	0.00**	0.61
16.	PSS	17.17± 6.07	16.53± 5.20	3.73	0.06	17.90± 4.22	15.73 ± 4.73	12.12	0.00**	0.00*
17.	Subjective Sleep Quality	1.00± 0.59	0.97± 0.56	3.00	0.57	0.87± 0.51	0.87± 0.57	0.00	1	0.34
18.	Sleep latency	1.47± 1.01	1.37± 0.93	6.80	0.18	1.20± 1.10	1.20± 1.16	0.00	1	0.74
19.	Sleep duration	1.23± 0.82	1.20± 0.81	2.44	0.75	1.27± 0.69	1.33± 0.76	-4.72	0.60	0.81
20.	Habitual sleep efficiency	0.53± 0.94	0.37± 0.61	30.19	0.13	0.27± 0.58	0.27± 0.58	0.00	1	0.48

21.	Sleep disturbance	1.37± 0.67	1.07± 0.37	21.90	0.01*	1.52± 0.63	1.41± 0.63	7.24	0.18	0.30
22.	Use sleep medication	0.10± 0.55	0.03± 0.18	70.00	0.33	0.07± 0.25	0.03± 0.18	57.14	0.33	0.66
23.	Daytime dysfunction	0.50± 0.73	0.47± 0.68	6.00	0.71	0.90± 0.99	0.67± 0.88	25.56	0.09	0.39
24.	Total PSQI	6.20± 3.11	5.47± 2.40	11.77	0.01*	6.03± 2.75	5.83± 2.78	3.32	0.61	0.62

DISCUSSION

The present study was conducted with an aim to see the effect of yoga and diet intervention on symptoms, BMI, weight, waist hip ratio, mid arm circumference, stress, sleep quality and thyroid profile.

In clinical parameter

Tiredness- In **Group A** and **Group B** the pre-post results for tiredness shows that there is a highly significant changes (P<0.000). Group A and Group B are equally effective for tiredness.

Irregular menstruation-In **Group A** and **B** the pre-post results for Irregular menstruation shows that there is a highly significant change. Group A and Group B are equally effective for tiredness.

Dry skin-In Group A and B the pre-post results show that there is a highly significant change. Group A and Group B are equally effective for dry skin.

Joint stiffness-In **Group A** and **B** the pre-post results show that there is a highly significant change. Group A and Group B are equally effective for joint stiffness.

Hoarseness of voice-In **Group A** and **B** the pre-post result shows that there is a highly significant change. Group A and Group B are equally effective for hoarseness voice.

Swelling-In **Group A** the pre-post results show that there is a highly significant change (P<0.001). In **Group B** the pre-post result shows that there is a significant (P<0.031).

Between group analysis shows (P<0.170) there is no significant Difference.

Poor appetite-In **Group A** the pre-post results show that there is a highly significant change (P<0.005). In **Group B** the pre-post result shows that there is not significant (P<0.057). Between group analysis shows (P<0.305) there is no significant Difference.

Hair fall-In **Group A** and **B** the pre-post results show that there is a highly significant change. A and Group B are equally effective for hair fall.

8.3. Anthropometric Parameters

Weight-In both **group A** and **group B** the pre-post results for Weight shows that there is a highly significant (P<0.000). Between group analysis shows (P<0.014) there is significant Difference between Group A and Group B that is Group A and Group B are not equally effective for weight.

Body mass index-In **Group A** the pre-post results show that there is a highly significant change (P<0.000). In **Group B** the pre-post result shows that there is a significant. (P<0.015). Between group analysis shows (P<0.062) there is no significant change difference between Group A and Group B that is Group A and Group B are equally effective for BMI.

Waist hip ratio-In **Group A** the pre-post results show that there is not significant change (P<0.179). In **Group B** the pre-post result shows that there is a highly significant

change ($P<0.000$). Group A and Group B that is Group A and Group B are not equally effective for waist hip ratio.

Mid arm circumference-In Group A the pre-post result shows that there is not significant change($P<0.088$). In **Group B** the pre-post result shows that there is a highly significant change($P<0.004$). Between group analysis shows($P<0.387$) there is no significant difference between Group A and Group B that is Group A and Group B are equally effective for mid arm circumference.

BIOCHEMICAL PARAMETER

Serum T3 level-In Group A the pre-post results show that there is a significant change ($P<0.015$). In **Group B** the pre-post result shows that there is not significant change($P<0.510$). Between group analysis shows ($P<0.265$) there is no significant Difference between Group A and Group B that is Group A and Group B are equally effective for serum T3.

Serum T4 level-In Group A and B the pre-post results show that there is a not significant change. Group A and Group B are equally effective for Serum T4.

Serum TSH level-In Group A the pre-post results show that there is a highly significant change ($P<0.005$). In **Group B** the pre-post result shows that there is a highly significant. ($P<0.001$). Group A and Group B are equally effective for serum TSH. **8.5.**

PSYCHOLOGICAL PARAMETER

Stress level-In Group A the pre-post results show that there is significant change($P<0.055$). In **Group B** the pre-post result shows that there is a highly significant change. Group A and Group B are not equally effective for PSS.

8.25. Total Pittsburgh sleep quality index test-In Group A the pre-post results show that there is a significant change. In **Group**

B the pre-post result shows that there is not significant change. Between group analysis shows ($P<0.616$) there is no significant Difference between Group A and Group B.

CONCLUSION

The study revealed both interventions were equally effective in management of hypothyroid induced obesity. Apart from weight and perceived stress All other variables exhibited had similar effect on both groups, whereas significant change was observed in perceived stress and body weight, showing yoga treats all Kosha, effecting both Manomaya Kosha and anna maya kosha.

REFERENCES

- 1.WHO. (2020). WHO. World Health Organization (WHO): Obesity and overweight. <http://www.who.int> 2010/2020
- 2.Rotondi, M., Magri, F., & Chiovato, L. (2011). Thyroid and Obesity: Not a One-Way Interaction. *J Clin Endocrinol Metab*, (2), 96. <http://pubmed.ncbi.nlm.nih.gov/2/2/2021>
- 3.Ahirwar, R., & Mondal, P. R. (2019, January 1). Prevalence of obesity in India: A systematic review. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, Vol. 13, pp. 318–321.
- 4.Sanyal, D., & Raychaudhuri, M. (2016, July 1). Hypothyroidism and obesity: An intriguing link. *Indian Journal of Endocrinology and Metabolism*, Vol. 20, pp. 554–557.
- 5.Sanyal, D., & Raychaudhuri, M. (2016, July 1). Hypothyroidism and obesity: An intriguing link. *Indian Journal of Endocrinology and Metabolism*, Vol. 20, pp. 554–557.

- 6.Santini, F., Marzullo, P., Rotondi, M., Ceccarini, G., Pagano, L., Ippolito, S., Biondi, B. (2014a). The crosstalk between thyroid gland and adipose tissue: signal integration in health and disease. *European Journal of Endocrinology*, 171, 137–152. <https://search.ebscohost.com>. 4/3/2021
- 7.Biondi, B. (2010). Thyroid and obesity: An intriguing relationship. *Journal of Clinical Endocrinology and Metabolism*, Vol. 95, pp. 3614–3617. <https://www.worldwidejournals.com> 23/3/2021
- 8.Priyanka. A,Sahana K. R, G. H. (n.d.). Prevalence of Thyroid Dysfunction Among Young Females of Urban And Rural Population in and Around Bangalore. <https://www.worldwidejournals.com> 23/3/2021
- 9.Unnikrishnan, A., Bantwal, G., John, M., Kalra, S., Sahay, R., & Tewari, N. (2013). Prevalence of hypothyroidism in adults: An epidemiological study in eight cities of India. *Indian Journal of Endocrinology and Metabolism*, 17(4), 647.<https://www.researchgate.net> 28/3/2021.
- 10.world health organization. (n.d.). *obesity and overweight*. <http://www.who.int> 23/11/2020
- 11.Ahirwar, R., & Mondal, P. R. (2019, January 1). Prevalence of obesity in India: A systematic review. *Diabetes and Metabolic Syndrome: Clinical Research and Reviews*, Vol. 13, pg. 318–321.

CORRESPONDING AUTHOR

Dr Sunita Jain
Govt. Ayurved College Raipur (CG)
E-mail: sunita.bnys@gmail.com

Source of support: Nil

Conflict of interest: None Declared

Cite this article as

Dr Sunita Jain: To Assess The Efficacy of Yoga and Diet Intervention in Hypothyroid Induced Obesity; IX(2): 2431-2438