

Study on Yoga Intervention along with Diet on Hypothyroidism Associated with Obesity among Sedentary Working Women in West Bengal

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ABSTRACT

Hypothyroidism in association with obesity, the most common endocrine disorders among females in urban areas. The objective is to find out the effect of yoga intervention on hypothyroidism linked with obesity among working women leading sedentary lifestyles in urban areas. Further to assess the recovery through yoga practice in addition to diet follow up treated as safe, very low cost, natural therapy. Total 150 obese women had a history of hypothyroidism within the age group 30-50 years located in eastern parts of West Bengal were enrolled for this study from June,17 to January, 18. A qualitative study by purposive sampling method was used applying BMI as the main parameter along with questionnaires & thyroid function tests, blood tests as secondary data. The study revealed initially that there was no such deficiency of nutrients like Iodine even though elevated TSH & normal or low T4 among the subjects. The correlation coefficient for weight status & hypothyroid type was $r = .427$ (significant) while HT & practice of diet with yoga or only yoga was $r = -.039$ and with TSH, $p = .014$, $p < 0.001$ ($p < .001$ or $P = 0.000$ means $p < 0.0005$) & (TSH- Practice - Correlation is significant at the 0.05 level, 2-tailed). Post yoga intervention, obesity class –I reduced from 54.7% to 51.3% & mild/moderate hypothyroidism converted to subclinical stage 7.4%. The study found that only diet practice is good for weight loss but more or remarkable benefits can be achieved if diet clubbed with yoga or by simple 45-60 minutes of daily yoga practice for recovery of hypothyroidism associated with obesity in women community.

Keywords : Hypothyroidism, Yoga practice, Obesity, Diet, BMI,

Introduction

Yoga can improve not only physical but also mental wellbeing of a person. Studies found that practicing yoga for month after month can significantly reduce abdominal fat. 12 weeks or more yoga intervention can change body weight, the percentage of body fat, so progress of body mass index (BMI) [1]. Measuring parameters are waist circumference, hips waist ratio, BMI, muscle mass, body water. Yoga is one of the supportive or complementary therapy in combination with western medical therapy for the treatment of the hypothyroid disorder. Certain asanas,

pranayamas, and bandhas which can provide better effects on thyroid gland by controlling the feedback mechanism of hypothalamus-pituitary-thyroid axis & overall control to thyroid hormones [2]. Yoga practice daily 45-60 minutes is also considered very effective for liver health maintaining major enzymes like SGOT, SGPT, and weight in human beings [3]. Yoga practices purify mind and body & enable us to gain self-realization through Vedanta. Yogic practices are very safe, effective natural treatment modalities and can be used as preventive measures for hypertensive patients [4]. Yoga & open-air

exercises have a high impact on body composition, oxidative stress markers, and antioxidant status by scavenging free radicals, so yoga has an anti-inflammatory & other therapeutic health benefits [5]. This study tried to find out the impact & effect of yoga practice also practice in conjunction with a weight loss diet for the recovery or prevention to hypothyroidism which is somehow linked with obesity [6,9]. High leptin results in hyperthyrotropinemia of obesity and also increase susceptibility to thyroid autoimmunity and the subsequent hypothyroidism. L-T4 treatment protocol is already being practiced for subclinical to overt hypothyroidism where weight loss is almost mandatory.[7,10]. Even at short term 15-20 days regular pranayama and meditation practice can improve cardiovascular functions irrespective of age, gender, and BMI in the Indian community [8, 12]. So overall yogic intervention has always the significant positive effect of on general and mental wellbeing among urban population mainly on middle-aged working for sedentary women population.

Materials & methods

2.1. Procedure

Selection of Subjects/Samples

Total 150 obese & hypothyroid female patients who attended the Diet Clinic (paid) & free yoga Camps located in north Kolkata for the diet consultation were enrolled for this study. Every participant had undergone the test of thyroid stimulating hormone & Thyroxin hormone only (T4) but not T3 by electrochemiluminescence immunoassay method (ECLIA). The participants who were leading sedentary lifestyles since few years after marriage did not have yoga practice history rather all were employed in a desk job,

Study Design & Duration

A qualitative study with purposive sampling method was conducted based on all the subjects visited 4 times within June

2017 to January 2018 (eight months) with the common complaint obesity along with hypothyroidism.

Tools & Techniques used

Data collected through questionnaires based on socio-demographic data, food-frequency, cooking & eating habits in addition to exercises/activities details (if any). Ultrasonography, FSH, LH, Estrogen & Testosterone for PCOS; Blood sugar level –fasting, P.P, HbA1C for diabetes; LDL, HDL, TGL for dyslipidemia; lung function tests reports, B.P (periodical checkup) including some other available tests reports were noted from patients as secondary data. Although all reports were taken for medical history purposes but TSH, T4 reports were considered majorly for this study. Levothyroxine 25mcg - 100mcg tablet were considered for this study as common western treatment protocol based on Thyroid peroxidase antibody (TPO ab < 60 U/ML was considered normal) & American Thyroid Association mostly following by all leading testing/diagnostic centers in Kolkata. In the study, apart from TSH, T4, height in cm. & weight in kg. was directly taken on the spot during 1st & 4th (last) consultation by calculating BMI dividing weight (kg) by height (m²). BMI \geq 23.0 was considered overweight as well as obese \geq 25 in Asian population as per WHO.

2.2. Western Medicine (protocol) with Diet follow up

The intervention was performed into two phases, first four months with 25 -100mcg levothyroxine (as per prescription of physician/endocrinologist) with weight loss diet by the dietitian. This 4 months-phase was conducted based on two visits at every 2-month interval, so total 4 visits.

2.3. Yoga Intervention

2nd four months phase was performed without this western medication but started yoga practice for average 45 minutes per

day preferably in the early morning in continuation with same weight loss diet plan (since 1st phase) at subject's own home/nearby place.

Body poses (Yoga as asana)[1,11]

Mountain pose (tadasana) – Modified sun salutation (surya namaskara) – Core exercises (navasana) – Half shoulder stand (ardha sarvangasana) – Bridge pose (setu bandhasana) – Fish (matsyasana) – (Half) seated forward bend (pascimottanasana) – Cobra (bhujangasana) – (Half) locust (salabhasana) – Cat (marjaryasana) – Downward dog (adho mukha svanasana) – Child pose (garbhasana) – Spinal twist pose (ardha matsyendrasana) – Tree (vrksasana) – Warrior II (virabhadrasana II) – Triangle (trikonasana) – Standing forward bend (pada hastasana). [1,11]

2.4. Statistical Methods

The statistical analysis performed by SPSS version -16 as a tool. The following tests were used 1) Graphical illustrations 2) Bivariate Correlations (Pearson correlation coefficients).

3. Results

i) The results were found in two parts 1st phase (first 4 months) & 2nd phase (next 4 months). At first phase, The

numbers of subjects under obesity class -I found 54.7% & overweight 3.3 %, whereafter yoga intervention the results came 51.3% and 2.7% subsequently. So there was a significant improvement of weight in respect of BMI as parameter post yoga practice.

- ii) Same way, moderate level & subclinical level hypothyroidism nos. were 44% and 10% but after yoga intervention, the figures showed 41.3% and 5.3% respectively. The progress was observed due to the control of TSH level which was positively correlated with obesity. (TSH high or slightly elevated but normal T4; the status remains under hypothyroidism).
- iii) The study revealed that there was no such deficiency of nutrients, only little elevated TSH & normal or slightly low T4 level among the subjects. The correlation coefficient for weight status & hypothyroid type was $r = .427$ (significant). TSH & Practice of diet with yoga or only yoga, $r = -.199$ ($p=.014$), correlation is significant at the 0.05 level (2-tailed). Post yoga intervention, obesity class –I reduced from 54.7% to 51.3% & mild/moderate hypothyroidism converted to subclinical stage 7.4%.

3.3 1ST PHASE - (4 MONTHS) :

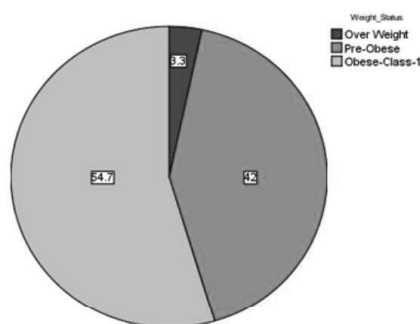


Fig.1 - Weight status

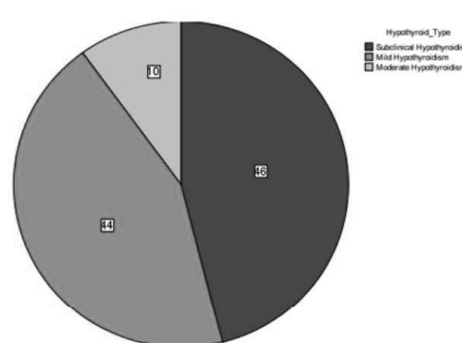


Fig.-2 – Hypothyroid Types

3.4. 2ND PHASE - (4 MONTHS) :

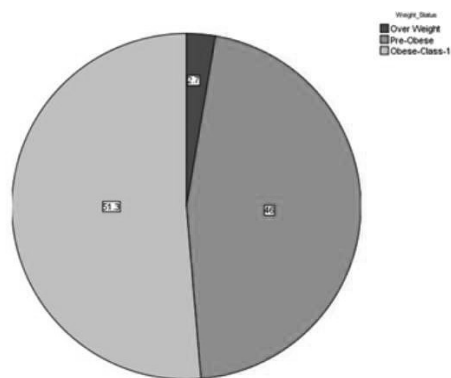


Fig.3 - Weight status

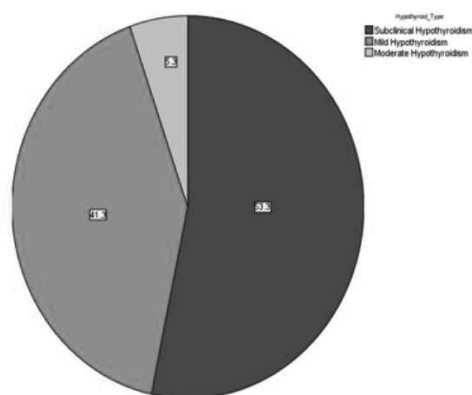


Fig.4 – Hypothyroid Types

In the above four pie charts, study showed the significant difference between two phases.

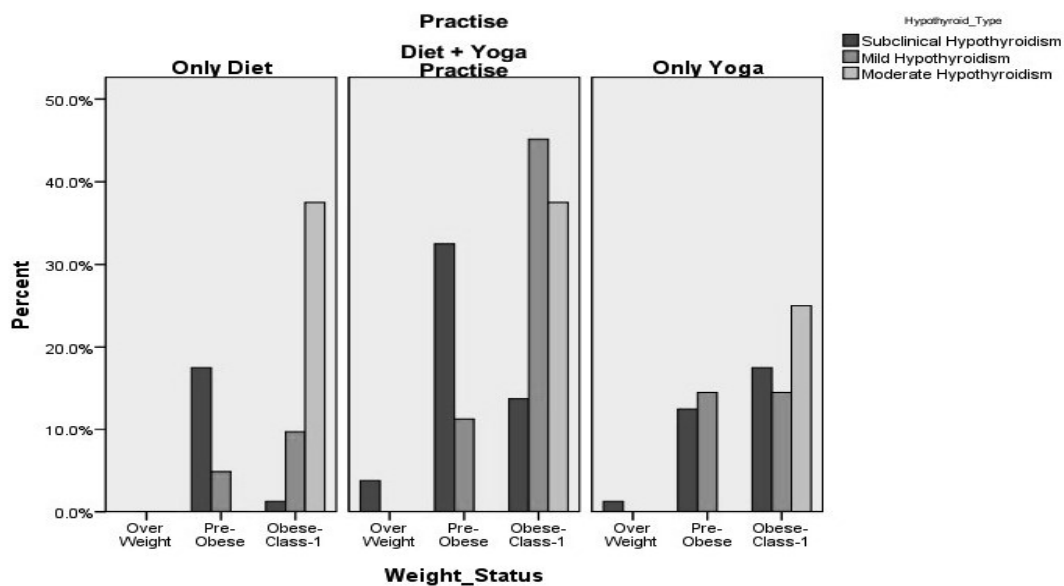


Fig. 5 : Weight Status Vs Hypothyroidism states vs 3 types Practices

Table :-1. Weight Status

Weight States	Frequency	Percent	Valid Percent	Cumulative Percent
Over Weight	4	2.7	2.7	2.7
Pre-Obese	69	46.0	46.0	48.7
Obese-Class-1	77	51.3	51.3	100.0
Total	150	100.0	100.0	

Table -2 : Hypothyroid Type

Hypothyroidism States	Frequency	Percent	Valid Percent	Cumulative Percent
Subclinical Hypothyroidism	80	53.3	53.3	53.3
Mild Hypothyroidism	62	41.3	41.3	94.7
Moderate Hypothyroidism	8	5.3	5.3	100.0
Total	150	100.0	100.0	

Table -3 : Practice with only diet or yoga or combined

Various Practices	Frequency	Percent	Valid Percent	Cumulative Percent
Only Diet	27	18.0	18.0	18.0
Diet + Yoga Practice	78	52.0	52.0	70.0
Only Yoga	45	30.0	30.0	100.0
Total	150	100.0	100.0	

Table-4 : Correlations – Variables of the study

		Weight Status	Hypothyroid Type	Practice	BMI	TSH
Weight Status	Pearson Correlation	1	.427**	.093	.808**	.394**
	Sig. (2-tailed)		.000	.258	.000	.000
Hypothyroid Type	Pearson Correlation	.427**	1	-.039	.406**	.786**
	Sig. (2-tailed)	.000		.639	.000	.000
Practice	Pearson Correlation	.093	-.039	1	.045	.199*
	Sig. (2-tailed)	.258	.639		.585	.014
BMI	Pearson Correlation	.808**	.406**	.045	1	.376**
	Sig. (2-tailed)	.000	.000	.585		.000
TSH	Pearson Correlation	.394**	.786**	.199*	.376**	1
	Sig. (2-tailed)	.000	.000	.014	.000	

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Discussion

The study showed that during the 1st four-month phase, 150 Obese women were consuming Thyroxine tablets (levothyroxine) 25mcg -100mcg as per prescription of their physicians one tablet per day at empty stomach for subclinical or mild to moderate hypothyroidism due to elevated serum TSH & normal or little low FT4. During this stage, at first visit, a low-calorie diet was advised for weight loss in conjunction with levothyroxine therapy. On a 2nd visit during the same phase while patients visited for diet consultation

again, found some weight loss but not for everyone due to some other issues and few cases found no properly diet follow up by self-motivation, therefore, no satisfactory result. Hence all were shifted for the next phase with an alternative plan that was 'Yogic Intervention'. There was a free camp conducted to demonstrate few effective poses as Asanas for which they had been asked to practice everyday morning at their home at the suitable place. On the 3rd visit on 2nd phase while the subjects visited for both diet as well as yogas to ask some doubts or reviews

/follow up then found all were self-motivated, energetic & willing to continue the yoga. This clearly meant that yoga has had a very good effect and influence on everyone's mind in addition to the body. At last on 4th or last visit, all subjects found a significant loss of weight since they at a percentage, lost their weight which shows the progress of BMI and level of TSH. The statistical reports showed that there were significant relations with all the variables like Obesity with TSH & BMI. Finally, there was a negative correlation with Practice to Hypothyroid Types which meant that if 'practice' increased the chance of 'hypothyroidism' decreased at its state (Moderate to subclinical conversions happened). Therefore, in Indian climate specifically at metro cities, big numbers of women who are sedentary, doing desk jobs or sitting works should practice yoga at their own pace at least 30 minutes or more for better results on obesity or obesity-induced hypothyroidism or hypothyroidism for any reason. Moreover, this also reduces stress & provides peace of mind. Balanced diet practice is always good which is based on our natural foods but it is always better to spare some time for yoga clubbing with diet in our daily life to

get the best health for lifelong, of course, while concerning a growing numbers people are suffering from diabetes, hypertension and other lifestyles/non-communicable diseases.

Conclusions

At first phase, subjects were only practicing diet for weight loss & Levothyroxine (as western medicine) for hypothyroidism, but after yoga camps & intervention, all were motivated to start practicing yoga (Asanas) per day 45 minutes. Finally, diet in conjunction with yoga intervention resulted in significant improvement to all subjects at no cost. Moreover, yoga intervention was the safest choice for all of them in this study and that not only for physical health but also mental wellbeing.

Acknowledgment

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ii) Thanks to Medisafe Diagnostic center, Barasat for data (TSH, T4 reports & other tests reports as soft copies).

Conflicts of interest

The author declares no conflict of interest.

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