

Impact of the Specific Ashtanga and Hatha Yogic Practices on Serum Cortisol and Stress Level Among the Obese Women

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Abstract- *The purpose of the study was to find out the impact of the specific Ashtanga and Hatha yogic practices on Serum Cortisol and Stress level among obese women. Thirty obese women (aged 30 to 45 years) living in Kondapur, Hyderabad were selected. Subjects were randomly assigned into three experimental groups. Each group consists of 10 and were treated for a period of 12 weeks. The first group treated with the Specific Ashtanga Yogic Practices (AYP) and the second group with the Specific Hatha Yogic Practices (HYP) and the third group was considered as the Control group that did not receive any of the above treatment. Serum Cortisol level (blood samples) and Stress level assessment (Stress Questionnaire constructed by LathaSatish (1997)), were taken for all the three groups at the baseline and after a week of the treatment. Students paired 't' test was applied for examining the hypothesis. After 12 weeks of the study it is evident that in all the three AYP, HYP and Control group, the control group does not show any significant reduction in Serum Cortisol level while the AYP has shown the significant reduction over the HYP and Control group in a Stress level among the obese women. The results suggest the importance of practicing AYP for reducing the Stress level and controlling the Serum Cortisol level among the obese women.*

Keywords- Specific Ashtanga Yogic Practices, Specific Hatha Yogic Practices, Serum Cortisol level and Stress level.

I. INTRODUCTION

Stress is caused by both the physical and emotional behaviour. Especially in women, the stress factor is more as they are very emotional than men. Both working women and house wives are prone to stress. Working women are finding it more difficult to manage both the work and household activities and similarly the housewives in general, the family pressure make them prone to stress as well as doing their day to day job at home. It can also be caused by not knowing how to manage their time well or how to allot time for rest and relaxation. Few women are always under some fear and restlessness without any reason that is also a biggest factor for stress that also leads to the various health issues. These cannot be controlled only by medicine but needs treatment that

relaxes their mind and body which is exactly what yoga does. Stress is one's body way of responding to any kind of demand. Stress induces imbalance of the autonomic nervous system with the decreased activity of the parasympathetic nervous system and increased activity of the sympathetic nervous system.

Cortisol is one of the sterol hormones known as **glucocorticoids** secreted by the outer cortex of the adrenal gland. It is also considered as one of the stress hormones. It is secreted in large quantities over a long period of time when the body is under stress. Addison's disease (Hypocortisolism), also known as primary adrenal insufficiency, is a long term endocrine disorder in which the adrenal glands do not produce enough steroid hormones. Symptoms generally come on slowly and may include abdominal pain, weakness, and weight loss. Darkening in certain areas may also occur. Under certain circumstances an adrenal crisis may occur with low blood pressure, vomiting, lower back pain, and loss of consciousness. An adrenal crisis can be triggered by stress, such as from an injury, surgery, or infection. Cushing's syndrome (Hypercortisolism) is a collection of signs and symptoms due to prolonged exposure to cortisol. Signs and symptoms may include: high blood pressure, abdominal obesity but with thin arms and legs, reddish stretch marks, a round red face, a fat lump between the shoulders, weak muscles, weak bones, acne, and fragile skin that heals poorly. Women may have more hair loss and irregular menstruation. Occasionally there may be changes in mood, headaches, and a chronic feeling of tiredness.

Yoga is the healthy and natural means of treating the imbalance of cortisol and reducing the stress level by inducing the parasympathetic nervous system. It is a holistic approach to treat both the physical and mental state of a person by not only reducing the obesity and will also help to live a healthy and peaceful life.

Ashtanga Yoga or Raja yoga referring to the eight limbs leading to absolute mental control which include the moral and ethical guidelines, postures, breath work, sense withdrawal, concentration, meditation and self-absorption.

These eight steps basically act as a guidelines on how to live a meaningful and purposeful life. The chief practice of Ashtanga yoga is meditation. **“Yoga is the cessation of modifications of thought waves”-Yoga sutra 1.2.**

Hatha Yoga is a method to prepare the practitioner for the rigors of Raja yoga .The Hatha-Yoga gain control of the physical body and the subtle life force called Prana. When body and energy are under control Meditation comes naturally.

“Hatha yoga is solely and exclusively for the attainment of Raja yoga”.

-Hatha yoga pradipika 1.2.

The Pradipika is divided into four parts. The first explains the restraints on the behavior, observances, postures and food. The second describes the control or restraint of energy and the internal cleansing practices. The third deals with the seals, locks, channels of energy through which prana flows and the kundalini power. The fourth expounds the withdrawal of the senses from concentration, meditation and absorption. Being the first accessory of Hatha Yoga, Asana is described first. It should be realized that the Hatha yoga pradipika is a major treatise with the practical guidelines. It takes the practitioner from the culture of the body towards the sight of the self.

II. OBJECTIVES

1. To identify the comparative effect of AYP and HYP on Serum Cortisol and Stress level among the obese women.
2. To assess any difference in Serum Cortisol and Stress level between the effective groups and control group through the Yogic Practices.
3. To evaluate any difference in Serum Cortisol and Stress level between the effective groups through the evidence.

III. HYPOTHESIS

The AYP and HYP have significant positive effect on the Biochemical and Psychological variables among the obese women.

IV. METHODOLOGY

The purpose of this study was to find out the impact of specific Ashtanga and Hatha yogic practices on Serum Cortisol and Stress level among the obese women.30 obese women(aged 30 to 45 years) living in Kondapur, Hyderabad were selected . Subjects were randomly assigned into three experimental groups. Each group of 10 were treated for a period of 12 weeks.

The first group treated with the Specific Ashtanga Yogic Practices (AYP) and the second group with the Specific Hatha Yogic Practices(HYP) and the third group was considered as the Control Group that did not receive any of the above treatments. Serum Cortisol level (blood samples-morning 7-8 am, empty stomach) and Stress level assessment (Stress Questionnaire constructed by LathaSatish (1997)), were taken for all the three groups at the baseline (pretest) and a week after the treatment (posttest).

V. TRAINING SCHEDULE

The study window was planned for 12 weeks with the three phases and each phase had 1- 4 weeks duration.

TABLE1-AYP (MON-FRI,10-11AM)

1-4 weeks	4-8 weeks	8-12 weeks
WARM UP-5mins Forwardbend Backward bend Sidebend Twist Mukhadhouthi	WARM UP-5mins Forwardbend Backward bend Sidebend Twist Mukhadhouthi	WARM UP-2mins Forward bend Backward bend Sidebend Twist Mukhadhouthi
SURYANAMASKAR-5mins	SURYA NAMASKAR-5mins	SURYANAMASKAR-5mins
ASANAS-15mins Ardchakrasan Trikonasan Uttanpadasan Ekpadasan Bhujangasan Ardhadhanurasan Ardhasalabhasan Uttanasan Matsyasan Navasan Ardhastrasan Vakrasan Paschimauttanasan Ardhapadmasan Pawanmuktasan	ASANAS-15mins Ardchakrasan Trikonasan Uttanpadasan Ekpadasan Bhujangasan Dhanurasan Salabhasan Vipareetakarani Matsyasan Navasan Ustrasan Ardhamatsyendrasan Paschimauttanasan Padmasan Pawanmuktasan	ASANAS-15mins Ardchakrasan Trikonasan Uttanpadasan Ekpadasan Bhujangasan Dhanurasan Salabhasan Sarvangasan Matsyasan Navasan Ustrasan Ardhamatsyendrasan Paschimauttanasan Padmasan Pawanmuktasan
PRANAYAMA-15mins Kapalabhati, Yogic breathing Surya Bedhana Anulom-viloma	PRANAYAMA-15mins Kapalabhati Yogic breathing Surya bedhana Bhastrika Ujjayi, Anulom-viloma	PRANAYAMA-15mins Kapalabhati Yogic breathing Surya bedhana Bhastrika Ujjayi Anulom-viloma
SOHAM MEDITATION-7mins	SOHAM MEDITATION-15 mins	SOHAM MEDITATION-20mins
RELAXATION-13mins	RELAXATION-5mins	RELAXATION-3mins

TABLE 2-HYP (MON-FRI, 5:30-6:30 PM)

1-4 weeks	4-8 weeks	8-12 weeks
WARM UP-5mins Forward bend Backward bend Sidebend Twist Mukhadhouthi	WARM UP-5mins Forward bend Backward bend Sidebend Twist Mukhadhouthi	WARM UP-5mins Forward bend Backward bend Sidebend Twist Mukhadhouthi
SURYANAMASKAR-7mins	SURYA NAMASKAR-10mins	SURYANAMASKAR-10mins
ASANAS-30mins Ardhachakrasan Trikonasan Uttanpadasan Veerabhadrasan Bhujangasan Ardhadhanurasan Ardhasalabhasan Vipareetakarani Matsyasan Navasan Ardhastrasas Vakrasan Paschimauttanasan Ardhapadmasan Pawanmuktasan	ASANAS-30mins Ardhachakrasan Ardhakattichakrasan Trikonasan Uttanpadasan Veerabhadrasan Bhujangasan Dhanurasan Salabhasan Ardhasirasas Sarvangasan Jataraparivartan Matsyasan Navasan Ustrasas Ardhamatsyendrasan Paschimauttanasan Baddhakonasas Padmasan Pawanmuktasan	ASANAS-30mins Ardhachakrasan Ardhakattichakrasan Trikonasan Uttanpadasan Sarvangasan Bhujangasan Dhanurasan Salabhasan Ardhasirasas Vipareetakarani Jataraparivartan Matsyasan Navasan Ustrasas Ardhamatsyendrasan Paschimauttanasan Baddhakonasas Padmasan Pawanmuktasan
PRANAYAMA-10mins Kapalabhati Yogic breathing Anulom-viloma	PRANAYAMA-10mins Kapalabhati Bhastrika Yogic breathing SuryaBhedhana Anulom-viloma	PRANAYAMA-10mins Kapalabhati Bhastrika Yogic breathing SuryaBhedhana Anulom-viloma
RELAXATION-8mins	RELAXATION-5mins	RELAXATION-5mins

VI. STATISTICAL ANALYSIS

Data were statistically analysed by using the paired t-test. Level of significance was set at $p=0.05$. Probability p value <0.05 was considered as statistically significant.

i.) Mean, Standard Deviation(SD), Mean Difference(MD), Standard Error Mean Difference (SEMD) and its significance in Serum Cortisol level($\mu\text{g/dL}$).

TABLE 3

AYP group	TEST	MEAN \pm SD	MD	SEMD	t-value	p-value
	Pre	13.07 \pm 6.05	2.81	1.91	1.55	0.15(NS)
	Post	10.27 \pm 2.26		0.71		

TABLE 4

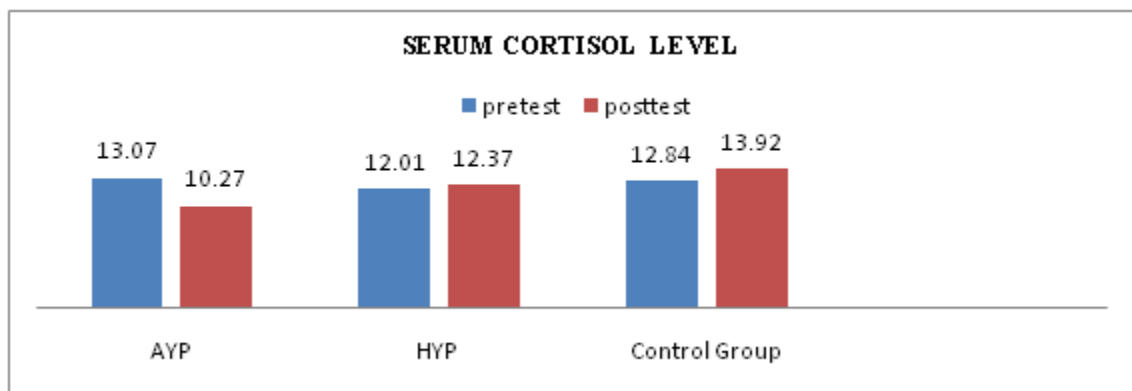
HYP group	TEST	MEAN ±SD	MD	SEMD	t-value	p-value
	Pre	12.01±4.57	-0.35	1.44	0.31	0.75(NS)
	Post	12.37±5.0		1.58		

TABLE 5

Control group	TEST	MEAN ±SD	MD	SEMD	t-value	p-value
	Pre	12.84±4.64	-1.07	1.46	0.92	0.37(NS)
	Post	13.92±6.31		1.99		

NS-Non Significance

Bar diagram shows the mean difference among the yogic practices and control group on Serum Cortisol level among the obese women.



ii.) Mean, Standard Deviation (SD), Mean Difference (MD), Standard Error Mean Difference (SEMD) and its significance in Stress level.

TABLE 6

AYP group	TEST	MEAN ±SD	MD	SEMD	t-value	p-value
	Pre	14±7.07	7.30	2.23	5.65	0.00(S)
	Pos	6.7±5.83		1.84		

TABLE 7

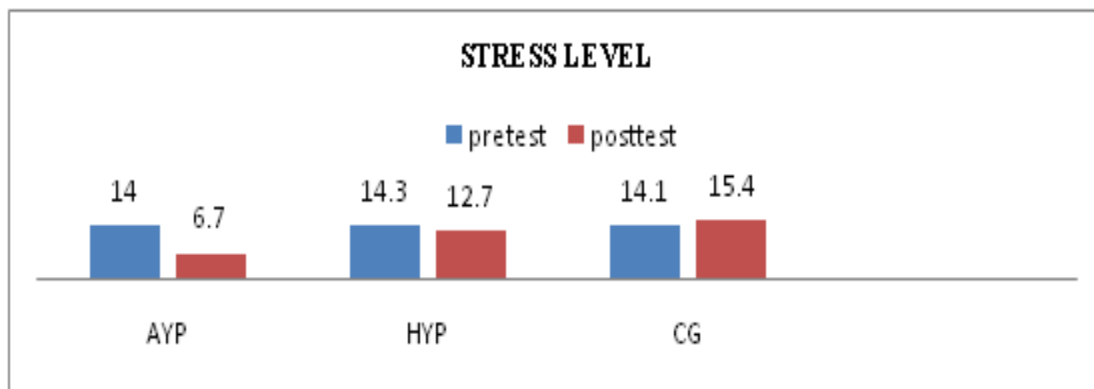
HYP group	TEST	MEAN ±SD	MD	SEMD	t-value	p-value
	Pre	14.3±7.19	1.60	2.27	1.45	0.17(NS)
	Pos	12.7±6.37		2.01		

TABLE 8

Control group	TEST	MEAN ±SD	MD	SEMD	t-value	p-value
	Pre	14.10±5.27	-1.30	1.66	1.14	0.28(NS)
	Pos	15.4±5.79		1.83		

S-Significance, NS-Non significance

Bar diagram showing the mean difference among the yogic practices and control group on the Stress level among the obese women.



VII. RESULTS AND DISCUSSIONS

1) Serum Cortisol level

After 12 weeks of study it is evident that all three AYP (n=10, pretest mean $\mu\text{g/dL} \pm \text{SD}$ -posttest mean $\mu\text{g/dL} \pm \text{SD}$, t' value, p value: $13.07 \pm 6.05 - 10.27 \pm 2.26$, $t=1.55$, $p=0.15$) HYP (n=10, $12.015 \pm 4.57 - 12.37 \pm 5.0$, $t=0.31$, $p=0.75$) and Control group (n=10, $12.84 \pm 4.64 - 13.92 \pm 6.31$, $t=0.92$, $p=0.37$) do not show significant ($p < 0.05$) reduction in cortisol level among the obese women.

A similar study by Thirthalli J. et al.; documented that the change in serum cortisol level was significant (n=38, $111.9 \text{ ng/ml} \pm 58.4 - 91.7 \text{ ng/ml} \pm 47.3$; $t=2.94$; $P=0.006$) in patients who received yoga with or without medication over drug only group (n=16, $95.7 \text{ ng/ml} \pm 62.1 - 113 \text{ ng/ml} \pm 48.5$; $t=0.99$; $P=0.34$).

Another study by InduMandal. et al.; reported that there was a significant decrease in the serum cortisol value in those who practiced yoga (n=40) for 3 months when compared with those who only took their standard treatment without practising yoga (n=40). A statistically significant ($p < 0.05$) decrease (from 13.72 ± 5.72 to $9.45 \pm 3.81 \mu\text{g/dL}$) was observed in the mean serum cortisol value of the study group after 3 months of yoga practice and there was no significant change in the control group ($12.08 \pm 4.96 \mu\text{g/dL}$).

At the end, we can see that our findings were not consistent with the study from Thirthalli and InduMandal, probably the sample size (each group 10) were less. It is possible that the results may show significant improvement if the sample size are more.

2) Stress level

After 12 weeks of the study, it is evident that the AYP (n=10, pretest mean $\mu\text{g/dL} \pm \text{SD}$ -posttest mean $\mu\text{g/dL} \pm \text{SD}$, t' value, p value: $14 \pm 7.07 - 6.7 \pm 5.83$, $t=5.65$, $p=0.00$)

have shown significant ($p < 0.05$) reduction in stress level over HYP (n=10, $14.3 \pm 7.19 - 12.7 \pm 6.37$, $t=1.45$, $p=0.17$) and Control Group (n=10, $14.1 \pm 5.27 - 15.4 \pm 5.79$, $t=1.14$, $p=0.28$) in stress level among the obese women.

Similar study conducted by Jacalyn J. Robert .et.al. also reported that the MBM program had a positive effect on the perceived measures of stress and coping style in women.

Another study conducted by Jawad Fares and Youssef Fares on the medical students also reported that the reduction of anxiety and stress through the yoga practices.

The present study determines the AYP has a marked reduction in number of stress experience, perception among the women and it has reduced by 50% which is mostly attributes to the meditative and pranayama component in the practice. In comparison, the HYP who have shown a decrease in stress score, but not significant and this had more of body oriented or somatic practices and less emphasis on mindfulness.

VIII. CONCLUSION

The present study concludes the importance of AYP in reducing the Stress level over the Hatha yoga and control group. It is also noted that the AYP had a certain influence on controlling the Serum Cortisol level although not significant result due to the limitations of the sample size.

Ashtanga yoga focuses mindfulness oriented practices which are essential for keeping one's mind in a balanced state. Whereas Hatha Yoga is more body oriented, no meditative and less pranayama which has its own physical benefits that may not help in controlling the Serum Cortisol and Stress level.

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