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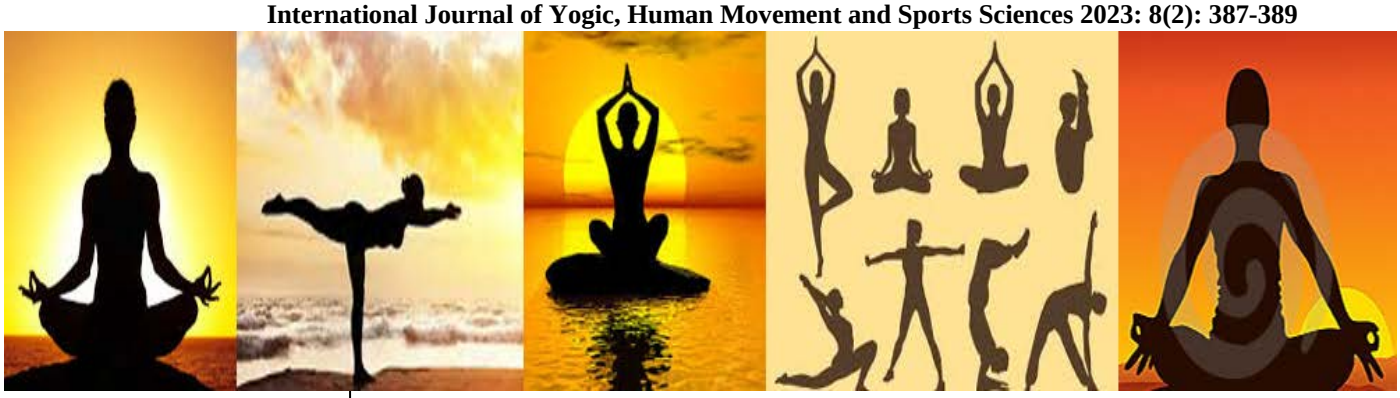

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Effects of yogic practices on levels of testosterone and polycystic ovarian syndrome women

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Abstract
Polycystic ovarian syndrome is a common endocrine disorder problem caused by an imbalance of reproductive hormones, characterized by menstrual irregularity and elevated serum androgens, and is often accompanied by insulin resistance among females. The hormonal imbalance enhances problems in the ovaries. The etiology of PCOS is still unknown. Yogic practices are recommended for women with PCOS to maintain a proper hormonal balance.
Purpose: To review the levels of effects of yogic practices on testosterone in polycystic ovarian syndrome women.
Methods: This study was conducted in a university-affiliated hospital from January 2023 to June 2023. Anthropometric parameters, sex hormone concentrations of the samples were analysed. A systematic review of original studies indexed in PubMed that utilized an exercise intervention in women with PCOS and reported hormone values pre- and post-intervention. Studies in which the effects of the yogic intervention could be determined were included.
Results: Fifty PCOS patients were recruited in this study. Yogic practices improve levels of testosterone in polycystic ovarian syndrome in women with PCOS. Studies with yoga are limited but suggest a reduction in levels of testosterone.
Conclusions: Recommended yogic practices help to normalize the levels of testosterone in polycystic ovarian syndrome women.

Keywords: PCOS, yogic practices, testosterone

Introduction

Polycystic Ovary Syndrome

Polycystic ovary syndrome (PCOS) is an exceedingly prevalent metabolic disorder and possibly constitutes the most frequently encountered endocrinopathy to affect women. There is considerable heterogeneity of symptoms and signs among women with PCOS, and for an individual these may change over time. The extreme end of the spectrum, once known as Stein-Leventhal syndrome, encompasses the combination of hyperandrogenism (hirsutism, acne, alopecia and elevated serum testosterone concentrations), severe menstrual disturbance (amenorrhea or oligomenorrhea) and obesity (Stein IF and Leventhal ML 1935) [11]. Polycystic ovarian syndrome (PCOS) is one of the most common endocrinal disorders among women, affecting 5-10% of women at their reproductive age (Franks, 1995) [12]. The syndrome was first defined in 1935 by Stein and Leventhal based on the observation of a set of symptoms such as amenorrhea, hirsutism and obesity in women whose ovaries were enlarged and contained multiple follicular cysts. It is a disorder in which women do not experience normal release of eggs from the ovaries (ovulation). They have an abnormal production of male hormones and their body is resistant to the effects of the hormone insulin. The manifestation and expression of PCOS symptoms such as polycystic ovaries, high levels of androgen hormones and irregular periods are variable from person to person. Then the argument relating to a PCOS diagnosis and treatment contributes to the overall current complexities of the syndrome.

Women with polycystic ovary syndrome (PCOS) need higher levels of progesterone to slow the frequency of GnRH pulse secretion, resulting in insufficient plasma follicle-stimulating hormone (FSH) synthesis and persistent plasma luteinizing hormone (LH) stimulation of ovarian androgens. The body therefore has to produce extra insulin to compensate. High levels of insulin causes the ovaries to produce too much testosterone, which interferes with the development of the follicles (the sacs in the ovaries where eggs develop) and prevents normal ovulation.

According to a recent study, practicing yoga may help decrease testosterone levels and alleviate symptoms of anxiety and depression in women with PCOS. More specifically, participants who did a one-hour yoga class six times a week for three months reduced testosterone levels. Can PCOS be treated with yoga? Practicing yoga regularly may help ease the symptoms of PCOS and decrease testosterone levels. It can also promote relaxation.

So the present pilot study is conducted mainly to assess the Effects of yogic practices on levels of testosterone in polycystic ovarian syndrome women.

Methods

The purpose of the study, fifty women who were suffering from Polycystic Ovarian Syndrome were volunteered as subjects. Their age ranged from 20 to 35 years. The purposive sampling technique was employed to pool the subjects from PM Santosha Multi Speciality Hospital, Kengeri, near Mahaveer Lakes Apartment, Sunkalpalya, Bengaluru 560060, Karnataka, India. Before the group were divided for experimental treatment, all the subjects were screened medically with the help of professionally qualified obstetricians and gynaecologists. Keeping the above concepts, the following biochemical namely Serum Testosterone (ST) selected as criterion variable. The yogasana, pranayama, mudra, and meditation Practices were selected as independent variables.

Pre-test and post-test have been done. For pre-test the following data will be conducted. Fasting sample of venous blood (10 ml) was drawn in the morning (6:00-8:00am) at the Plexi Health Lab. Hormone estimates including total testosterone (TT) was done by Fully Automated Bidirectionally Interfaced Chemi Luminescent Immuno Assay.

Yoga intervention

The concepts for the intervention were taken from traditional yoga scriptures (Patanjali yoga sutras, Upaniśads and Yoga Vasishtha) that highlight a holistic approach to health management at physical, mental, emotional and intellectual levels (Nagarathana R and Nagendra HR 2011) [13]. The practices consisted of āsanas (yoga postures), prāṇayama, relaxation techniques, meditation, and mudras. The physical practices progressed from Suryanamaskāra to final yoga postures āsanas of four categories (prone, standing, supine and sitting) to provide activation followed by deep rest to mind body complex based on scriptural reference (Nagendra 2007) [15]. Prāṇayama included yogic breathing practices to bring about a slow rhythmic breathing pattern with exhalation longer than inhalation. (Nagendra HR and Nagarathna R 2004) [14]. An attempt was made to elicit suggestions regarding the feasibility and applicability of each of the practices selected as the yoga intervention for PCOS. The integrated approach of yoga therapy practice is prepared with following basic structure:

1. First 8 minutes of the sessions was lectures focusing on management of PCOS topics described below
2. 12 minutes - Sun salutation and QRT
3. 12 minutes - Yoga Āsana (prone, standing, inverted and sitting)
4. 10 minutes - Mudras
5. 8 minutes - Prāṇayama
6. 10 minutes - Meditation.

The daily yoga session begins with interactive session and awareness talks which included the below listed topics that ensured the right understanding of yoga as a tool for body and mind management and notional correction.

Results

A “probable diagnosis” of PCOS was found among 50 women identified to have oligo/amenorrhea and/or clinical hyperandrogenism. All the 50 subjects asked to come for blood test. Pre-test and post-test is done. After 12 weeks of intervention, changes in testosterone were significantly different between the two groups.

Table 1: Analysis of Co-Variance of the Pre Test and Post Test Means of the experimental and control Group based on ST ng/dl

Group	Experimental	Control	Source of variance	Sum of squares	df	Mean square	‘F’ Ratio
Pre Test Mean	46.36	60.68	Between	2563.280	1	2563.280	4.238*
SD	20.9	27.7	Within	29029.200	48	604.775	
Post test Mean	35.16	66.04	Between	11919.680	1	11919.680	22.40*
SD	15.3	28.7	Within	25534.320	48	531.965	
Adjusted Post test mean	40.76	63.36	Between	13046.21	1	13046.21	12.67*
			Within	26715.160	48	588.047	

S - Significant
NS - Not Significant

From the above table the pre test mean score on experimental group is 46.36, control group is 60.68. Therefore, it is evident that the obtained ‘F’ value 4.238 for Pre-Test mean score. Therefore the framed research hypothesis is rejected. It is inferred that there is no significant difference between the pre-test means of the yoga practices on levels of testosterone in polycystic ovarian syndrome women. Also, the Post test mean score on Experimental group is 35.16, control group is 66.04. Therefore, it is evident that the obtained ‘F’ value 22.40 for Post-Test mean score. Therefore the framed research hypothesis is accepted. Further, the above table taking into consideration of the adjusted post test mean score on experimental group is 40.76, control group is 63.36. Therefore, it is evident that the obtained ‘F’ value is 12.67. Therefore the framed research hypothesis is accepted. It is inferred that there is a significant difference between the adjusted post-test means of the yoga practices on levels of testosterone in polycystic ovarian syndrome women.

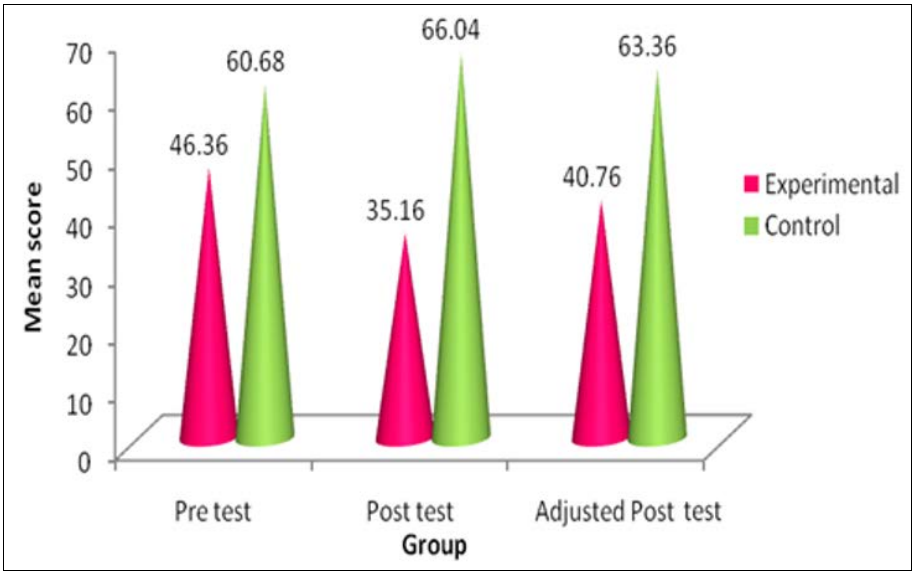

Fig 1: Shows mean score

Conclusions

Although it is known that high Androgen level is one of the characteristic features in PCOS women, the baseline testosterone value in our study group was well within the normal range (< 70 ng/dl). In the present study, a 12 week yoga intervention showed a significant 35.16, as compared to another control study. Yogic practices are beneficial in minimizing PCOS risk and helps to maintain the levels of testosterone. It may be considered evidence for the yoga intervention's efficiency in reducing levels of testosterone in the case of PCOS women.

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