Effect of Progressive Resistance Training And Yoga Exercise In Females With Polycystic Ovary Syndrome: A Randomized Control Trial

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Abstract- Background*: polycystic ovary syndrome (PCOS) adversely affect women at varying stages of their life and imperative to emphasis on prevention strategies since incidence of PCOS is on the rise. There are few systemic studies done in India.**Objective;**This Study aims to identify effect of progressive resistance training (PRT) and yoga in female with PCOS.**Methodology:** In this RCT30 sample were randomly selected) according to inclusion criteria and assigned to group A (yoga) group B (PRT) group C (control). Pre & post BMI and health related quality of life questionnaire (HRQOL) was taken. Treatment was given for 12 weeks for 3days/week for 30 min per session **Result:** Results showed improvement in yoga as Difference in pre and post values of BMI and weight of all groups showed significant improvement as (P =0.009) HRQOL in that emotion and body hair component showed significant improvement in PRT group. **Conclusion:**Thus both the treatment techniques were effective so can be given as alternative treatment to female suffering from PCOS.*

Keywords- PCOS, yoga, Progressive resistance training.

I. INTRODUCTION

Polycystic Ovary Syndrome (PCOS) is a heterogeneous endocrine disorder affecting 4-12% of female during their reproductive age. It is considered to be chronic anovulation and hyperandrogenis in the absence of any pituitary diseases. Women with PCOS may complain about different clinical symptoms with oligomenorrhea, hirsutism, acne and infertility.[1]

Obesity, insulin resistance and type II diabetes, dyslipidaemia, hypertension, cardiovascular diseases, abnormal menstrual pattern, increase incidence of pregnancy loss and endometrial carcinoma are associated with PCOS. 50-60% of women with the PCOS is obese .PCOS also leads to psychological morbidity as well as depression poor body image, self-esteem and reduced health related quality of life. There are no systemic studies done on PCOS in India. Observation by gynaecologists, endocrinologist show a rise in women with PCOS in India and prevalence estimated is 9.13%.[2]

Studies suggest that genetic and environmental factors are responsible for the development of the syndrome. The distinctive feature of PCOS is persistent anovulation with a spectrum of symptoms that include obesity, insulin resistance and hyperandrogenism. PCOS is characterised by high Luteinizing Hormone (LH) and low Follicle Stimulating Hormone (FSH). In 60% of women with PCOS the level of LH is elevated. The high LH in PCOS is both due to increased amplitude and pulse frequency of LH secretion. Anovulation leads to secondary amenorrhoea. This may lead to obvious irregular cycles with varying cycle length ranging from a few days delay in cycle to months of amenorrhoea. The amount and duration of oestrogen breakthrough bleeding varies widely depending on the amount and duration of oestrogen stimulation that the endometrium has received. In certain situations due to the consistent stimulation of endometrium by high oestrogen may lead to heavy menstrual flow. Treatment for PCOS focuses mainly on lifestyle modifications that have been recommended to improve metabolic as well as reproductive manifestations of PCOS. [(2-3)]

Clinical features of PCOSMenstrual bleeding abnormalities, Infertility, Acne, Central obesity, increased risk of endometrial cancer, cardiovascular disorder and Diabetes mellitus .Symptoms of PCOS Menstrual cycle disturbance Oligomemnorrhoea, Amenorrhoea, Dysmenorrhoea, Obesity, Acne and hirsutism.These symptoms lead to a significant reduction in quality of life. Recent systematic reviews revealed that limited research was carried out to assess the impact that the symptoms and associated treatments for PCOS. Quality of life of PCOS women is affected as these women under go depression and pressure PCOS women related to hirsustism try to avoid activities in which body exposure is their (swimming) avoid social contact. It is becoming increasingly clear that PCOS is associated with several aspects of mental health and psychological wellbeing, including mood (e.g., depression and anxiety), eating disorders, self-esteem,

body dissatisfaction, and physical appearance. The comorbidity associated with depression is particularly alarming. For instance, depression has been associated with the metabolic (i.e., insulin resistance) and hormonal (i.e., level of free testosterone) aspects of PCOS. [4-5]

Majority of the endocrinologists and gynaecologists recommend non pharmacological measures such as diet & exercise as first line of treatment for oligomenorrhea, hirsutism, infertility and obesity in PCOS. Modification in lifestyle and dietary changes increased physical activity and behavioural therapy are considered as important aspects in the management of PCOS. Oxidative metabolism in tissues is highly induced by physical exercise and the oxidative metabolism of the ovary acts as a stimulant for follicular development.[2]

Maiya et al, 2008 stated, as weight loss by physical activity doesn't have any potential side effects it should be taken as first line of treatment. Graded aerobic exercise acts as a definite tool in decreasing the body weight, helps in reducing the cyst size, increasing the ovulation, and pregnancy rate in infertile obese PCOS patients. It is a well-known fact that exercise training improves many of the health-related outcomes, that include protection against the development of Coronary Vascular Disease and diabetes, lesser malaise and death rates and also elevates psychological benefits. The focalisation of PCOS is complex and not completely understood. The combination of increased androgens and/or insulin creates a latent or hidden hormonal imbalance.[3]

Genetic and environmental contributors to hormonal disturbances with other factors cyclist, ovulation and fertility, reductions in testosterone levels and free androgen index. The adaptation from physical to sedentary lifestyle and fast growing westernized diet culture in India has led to increase in metabolic liabilities of PCOS. My work aims to study about knowledge on PCOS among women with diagnosed PCOS, creating awareness on life style and diet modification, their concerns regarding PCOS and utilization of physiotherapy services that suits them the best. [9-10]

II. METHODOLOGY

The subjects fulfilling the inclusion criteria and willing to participate in the study were enrolled in to the study. Ethical approval was obtained from the institutional sub ethical committee. A written informed consent was taken from the participants. The total samples were 30 and divided into 3 groups of 10 per each group. Height and weight was measured to calculate BMI. Maternal status and working status of the women with PCOS was taken. menarch (in years) was also taken. During menstruation leave taken by the female with PCOS was also noted . Randomly participants were allotted in each group. Group A was given yoga and group B was given progressive resistance training and Group C is controlled group.

GROUP A (yoga exercise)

In group A yoga exercise was given for 12 weeks**Progression:** Every after 2weeks progression was done in the form of duration holding of yoga position which was increased according to the participant's capacity. Yoga Sana was given for 30 min

Following yoga exercise was given to the females with the PCOS Badhakonasana ,Bharadvajasana ,Bhujangasana,Naukasana,Dhanurasana ,ViparitaShalabhasana ,Balasana ,Chakkichalanasana ,Marajartasana And Bitilasana ,Prasaritapadottanasana ,Padmasana ,Shavasana.

GROUP B (Progressive resistance training)

In group B progressive resistance training program was given thrice a week on alternate days for 12 weeks with the intensity 60% of 1RM for 30 min every after 2 weeks again (1RM) was calculated for the progression and two sets of 8-10 repetition was given to the female with PCOS

Following progressive resistance training exercise were given to the female with PCOS Seated Row, Leg Press, Chest Press, Latissimus Pull and Hamstring Curl.

GROUP C (Control group)

In this group no intervention was given they were told to carry out their daily routine

STATISTICAL ANALYSIS

It was done using Winpepi software Sapiro –wilk test was applied to know if the data was normally disturbed. ANOVA was used to compared data

III. RESULTS

In this study ANOVA was used to compare data from before and after the 12 weeks exercise program P Value less than 0.05 were considered to be statistically significant .In this study BMI and weight were reduced significantly.HRQOL in this emotion and body hair component were significantly improved.

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IV. DISCUSSION

This study evaluated the effect of PRT and yoga in PCOS female with 30 females subject aged 20-40.the subject were selected according to the criteria mentioned and randomly allocated in 3 groups. The duration of the study was 12 weeks. The assessment of the subject was done by outcome measure like BMI and HRQOL questionnaire. GroupA received yoga Group B received PRT and Group C was control group. Post outcome measures were taken at the end of the 12 week.

Randevaetal showed that exercise such yoga reduces weight and insulin resistance an decreases risk of cardiovascular risk in overweight PCOS female Varalakshmi Desai et al studied that there was weight reduction in female with PCOS and insulin resistance 30 min of yoga 3 times per week 90 females were include 30 were non PCOS 30 were with PCOS conclusion was there was great improvement in weight reduction in female with PCOS.Four more studies investigated that effect of yoga in PCOS women improve insulin resistance but there was not much improvement in weight reduction [13-14]. In this study pre and post reading was taken of all group and ANOVA was applied between the groups and much improvement was seen in BMI it was significant (P= 0.009) in group A (yoga) as yoga leads to modulation of neuroendocrine axis .chaya et al conclude that significant improvement in weight reduction because there is strong relation between stress and obesity in PCOS women the hypothalmo pituitary ovarian axis is disturb which leads to all PCOS symptoms. Yoga eases stress through breathing techniques that bring relaxations within the body yoga strengthens the muscles , improves hormonal levels and combats insulin resistance

Female with PCOS were more likely to suffer from psychological disorders BMI, hirsutism, acne, menstruation and infertility these symptoms were present, their manifestation was perceived to be more severe by female with PCOS PCOS female had significantly worse quality of life all seven factors of the modified PCOSQ. Weight difficulties were the greatest contributory factors to reduced quality of life in the PCOS female. Weight concerns were more severe in the PCOS female .PCOSQ has also shown weight to be the largest contributor to reduced quality of life in PCOS[10-11] (Guyatt et al., 2004; Jones et al., 2004; McCook et al., 2005) PCOS is directly associated with depression and reduced quality of life. This has important implications for the treatment and management of PCOS. Treatment of depression, although important in its own right, will have a positive effect on the medical management of PCOS. For example, depression reduces motivation (American Psychiatric Association, 1999) yet good motivation is key to compliance with medication and the exercise for PCOS female [22-24] (Willmott, 2000). For example, effective hair removal in hirsute female has been shown to improve self-esteem and quality of life (Keegan et al., 2003) and decrease anxiety and depression (Elsenbruch et al., 2003; Clayton et al., 2005) Treatment of depression is likely to have a positive effect on other features of the disorder, including weight management, insulin resistance and endocrine disturbances[16-17].

In this study the component of HRQOL are emotions and hair body these are one of the factors of quality of life which affect the PCOS women. The subject worked on exercise that is PRT protocol in which it consist of leg press, chest press, hamstring curls ,seated row , latissum pull due to which alleviate the release of endorphins which create feeling of happiness and decreases anxiety the depression in lower down Gordon W Bates et al.,(2013)[8] .

Recently Cheryce L Harrison et al. (2011) investigated that PCOS is a hormonal disorder One of the primary issues with PCOS female is that insulin producing cells seem to be over responsive and create too much insulin, causing hyperinsulinemia ovaries produce too much testosterone insulin causes ovaries to produce too much testosterone. Excess androgens (testosterone and other “male” hormones) cause ovarian cysts, acne and male pattern hair growth It seems that androgens act on the growth phase of the hair cycle, causing the hair to grouth.PRT exercise protocol showed a significant decrease in anxiety and body hair in women with PCOS in the recent studies investigated the natural circulating androgen level and change the estrogen /androgen balance in the body. In recent studies it has been said the androgen level is balanced and unwanted facial hairs or body is reduce [15-18].

Guzick et al., (2011) investigated that elderly female benefit from the hard or stress exercise training protocol and study showed that with the aerobic exercise of 3 to 6 months with diet control had a beneficial effect of weight loss and it has the improvement in reproductive system Further, Clark et al. (2010) showed that reduction of a low weight loss in anovulatory infertile female like obesity, achieved in a group setting over a six month period and improvement in ovulation, pregnancy rate and pregnancy outcome . These studies also showed that a BMI $\geq$ 27 is associated with an increased risk of ovulatory infertility[29].In our study infertility and menstrual problem is the component of HRQOL is both are not significant due to long term treatment is needed[17] .

V. CONCLUSION

This study conclude that body weight and BMI was significantly improved by yoga exercise.When quality of life was assisted, we found significant improvement in emotions, body hair component in PRT group whereas not significant changes seen in infertility ,menstrual problem and weight as per the questionnaire . Thus both the treatment technique showed their own results so both can be given as alternative treatment to females suffering from PCOS.

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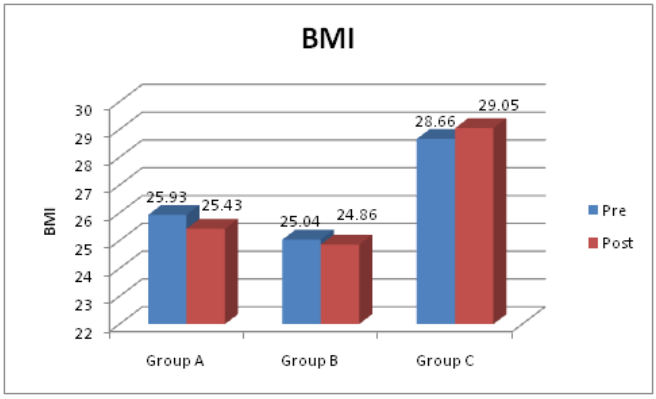
VI. APPENDEX

Demographic details of the women included in the study are shown in the table

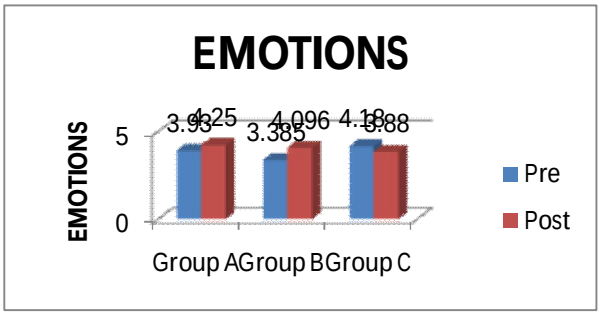
			GROUP A	GROUP B	GROUP C	OVERALL
1	AGE STATUS	MEAN AGE IN YEARS	30.7	20.9	25.9	25.8
2	MARRIED STATUS	UNMARRIED FEMALE	3	10	5	18
		MARRIED FEMALE	7	0	5	12
3	MENARCH	MEAN AGE OF MENARCH IN YEARS	13.5	13.2	12.7	13.1
4	MEAN BMI OF FEMALES	NORMAL WEIGHT	4	7	2	13
		OVERWEIGHT	5	2	7	14
		OBESE	1	1	1	3
5	WORKING STATUS	WORKING	6	0	5	11
		NON WORKING	4	10	5	19
6	ABSENTEE IN MENSES	% OF FEAMLE TAKING LEAVE DURING MENSES	40%	50%	40%	130%

GRAPH 1



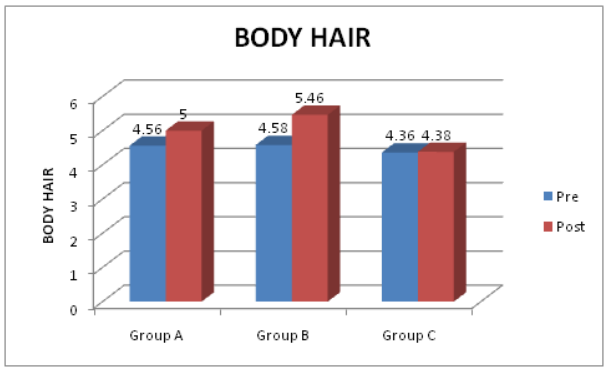
GRAPH 1: showing pre post mean BMI of female having PCOS in group A, B and C

GRAPH 2



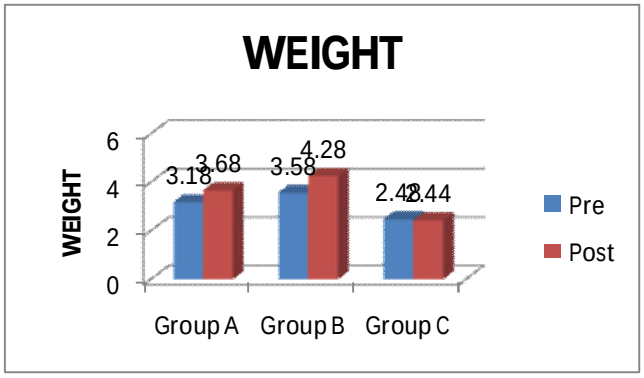
GRAPH 2: showing pre post mean emotions of female having PCOS in group A,B and C

GRAPH 3



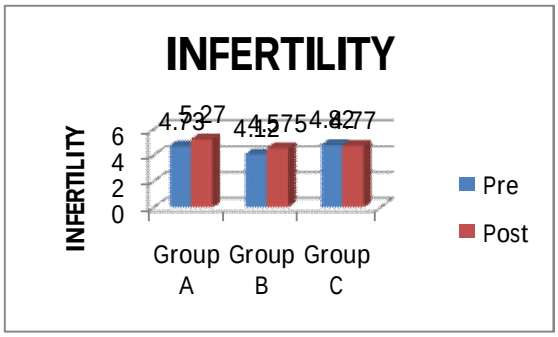
GRAPH 3: showing per post mean body hair of female having PCOS in group A,B and C

GRAPH 4



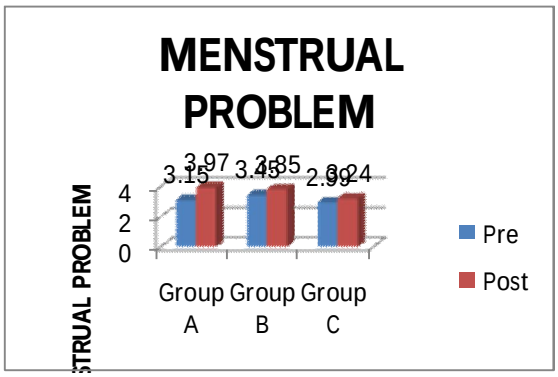
GRAPH 4: showing pre post mean weight of female having PCOS in group A,B and C

Graph 5



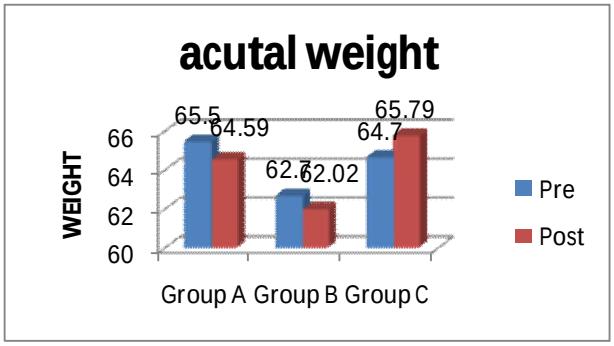
GRAPH 5: showing pre post mean infertility of female having PCOS in group A,B and C

GRAPH 6



GRAPH 6: showing per post mean menstrual problem of female having PCOS in group A,B and C

GRAPH : 7



GRAPH 7: showing per post mean actual weight of female having PCOS in group A,B and C

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