Effectiveness of Lifestyle Modification in Late Adolescent Females with Normal BMI Polycystic Ovarian Syndrome

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Abstract

Background and Objectives: The prevalence of PCOS varies from 2.2% to 26% in different countries. Between 20-50% of women with PCOS are normal weight or lean and the pathophysiology of the disorder in these women may differ from that of obese women; It has been suggested that PCOS develops in non obese women because of a hypothalamic pituitary defect that results in increase release of LH. To determine the effectiveness of life style modification in late adolescent with normal BMI polycystic ovarian syndrome .

Material and Methodology: 28 Normal BMI women with polycystic ovary syndrome were selected for the study. They received the life style modification including diet plan exercise plan. Pre –assessment of body weight is measured by body mass index (BMI),waist-hip ratio(W-H Ratio) and quality of life was scored as per polycystic ovarian syndrome questionnaire(PCOSQ) and post-interventional assessment was taken for the same after 3 months. The exclusion criteria included Type II diabetes, Cardio vascular problems, any concurrent hormone therapy within 6 weeks, pregnant women's or who are willing to conceive.

Result: Statistical analysis for PCOSQ was extremely significant (P value=0.0001).Statistical analysis for BMI revealed not significant in post intervention .Statistical analysis for W-H Ratio revealed not significant in post intervention.

Conclusion: Lifestyle modification helped in maintaining weight and showed increased quality of life in women with polycystic ovarian syndrome (PCOS).

***Key Words**: Life style modification, normal body mass index, walking, Polycystic ovarian syndrome.*

Introduction

Polycystic ovarian syndrome (PCOS) has been defined by the national institute of health and Rotterdam criteria as a hormonal disorder characterized by the presence of at least one polycystic ovary (presence of multiple cysts) accompanied by ovulatory dysfunction and excessive secretion of androgens.[15] PCOS is a fairly common condition in women of reproductive age[1].Polycystic ovarian syndrome is heterogeneous. [1] and nowadays it is recognized as most common endocrinopathy in reproductive aged women having key features like menstrual irregularity, elevated androgens and polycystic appearing ovaries.[2]

The prevalence of PCOS varies from 2.2% to 26% in different countries.[4] women with PCOS either have normal weight or are found lean in 20-50% women and the pathophysiology in these women may differ from that of obese women; it has been suggested that PCOS develops in non obese women because of a hypothalamic pituitary defect that results in increase release of LH.[4]

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The prevalence of normal weight and underweight patients with polycystic ovarian syndrome been reported1.5-6.6%.[7] The prevalence of PCOS is 9.13% in Indian adolescents.[15] The prevalence rate 6% in south India discover that the probability of urban women vulnerable to acquiring PCOS are 0.1 times higher than women in rural India.[16]

In previous study the subjects taken between the age of 18 to 24 years.[16]

Even in lean women with polycystic ovarian syndrome, we can see the higher waist- hip ratio, greater intra peritoneal and visceral fat[7]. By definition women with BMI< 25 are non-obese and with BMI >25 considered obese.[7]

Polycystic ovarian syndrome is associated so strongly with obesity therefore the women with normal weight often go undiagnosed.[10] Polycystic ovarian syndrome requires at least two of the following characteristics for the diagnosis; clinical or biochemical hyperandrogenism, anovulatory menstrual dysfunction and polycystic ovarian on ultrasound.[9]

Young adolescent girls experiences symptoms from irregular menses, amenorrhea, ovarian cyst, menorrhagia, hirsutism , acne, skin pigmentation .Symptoms like anxiety, depression, thyroid problem also may include.[5]

Obesity, type 2 diabetes, dyslipidemia, hypertension and cardio vascular disease has been linked with PCOS.[11] PCOS is an emerging health problem during adolescence therefore promotion of healthy lifestyle and early intervention are required to prevent future morbidities.[6]

In normal BMI women the polycystic ovarian syndrome seen because the connection between the pituitary gland and the ovaries broken down.

Importance of Lifestyle Modification

Life style modification commonly used as the first line treatment for PCOS women.[8]Life style modification contains dietary modification, physical activity and behavioral changes.[8]Exercise is important component of life style intervention by improving several benefits on cardio vascular, metabolic, reproductive and psychological health of women with PCOS[3]For physical activity, participation and compliance feeling of pleasure during exercise is an important factor.[3]In respect of new randomized controlled trail, arranged and regular physical exercise can improve insulin sensitivity and menstrual regularity in PCOS women.[3]

Maintaining weight can help reduce diabetes risk.[10]

METHODOLOGY

Ethical clearance was obtained from the Institutional Ethical Committee, KIMSDU, Karad. It is an experimental study was carried using cross sectional study design. The study was conducted in and around karad, Maharashtra and was carried over a period of 12 week. This study include 28 women diagnosed with PCOS. The study protocol was approved by Regional Ethical Committee. Exclusion criteria included Type II diabetes, Cardiovascular problems, any concurrent hormone therapy within 6 weeks, pregnant women's or who are willing to conceive. After baseline assessment, which include demographic data, body mass index (BMI), W-H ratio, questionnaire PCOS (PCOSQ) using random sampling method.

The hip and waist circumferences were determined using a tape measure, the widest circumference of buttocks and the smallest circumference of the hip.

The participant receive lifestyle modification which include diet, exercise, behavioral therapy

Exercise

Warm up exercise and cool down exercise for 10 minutes. The pcos exercise recommended atleast for 3 times per week. Aerobic exercise such as walking and jogging performed for 50-60 minutes per session.[13]

Diet

High protein diet include egg white, beans, pulses. Fruits like apple, guava, pear, grapes, oranges etc should be include. Tomatoes, sweet potatoes, pumpkin, almonds etc. High fiber and leafy vegetables are included. Avoid food with high glycemic index such as bakery and diary products.Pulses plays an important role in weight control[12]

Behavioural Management

Motivation and cognitive behavioural therapy to avoid negative thoughts and to improve state of mind.

Statistical Analysis and Results

Statistical analysis of the recorded data was done by using the software SPSS version 2.0. Study design is cross sectional. Arithmetic mean and standard deviation was calculated for each outcome measure. Paired t test was done.

BMI

Table no 1: Pre and post BMI score

	MEAN+ SD	**P VALUE**
PRE	21.6+1.3	< 0.0001
POST	21.7+ 1.5	< 0.0001

WAIST HIP RATIO

Table no 2: Pre and Post W-H Ratio

	Mean + SD	**P value**
PRE	0.84+0.04	< 0.0001
POST	0.84+0.04	< 0.0001

PCOSQ

	Emotion	**Weight concern**	**Body hair**	**Menstrual irregularity**	**Infertility**
	Mean+ SD	**Mean+ SD**	**Mean+ SD**	**Mean+ SD**	**Mean+ SD**
PRE	30.64 +3.4	17.39 +2.0	17.89 +2.0	14.17 +2.4	15.35 +1.89
POST	39.78 +3.15	28.14 +1.4	25.75 +1.93	20.64 +2.0	21.10 +1.68

	Mean+ SD	**P value**	**T value**
PRE	19.09 +6.4	<0.0001	
POST	27.08 +7.2	<0.0001	35.24

Table no 3: Pre and post PCOSQ

	Mean+SD	**Mean+SD**	
	PRE	**POST**	**P Value**
BMI	21.6+1.3	21.7+ 1.5	<0.0001
W-H Ratio	0.84+0.04	0.84+0.04	<0.0001
PCOSQ	19.09 +6.4	27.08 +7.2	<0.0001

Discussion

Polycystic ovarian syndrome is associated so strongly with obesity therefore the women with normal weight often go undiagnosed. Even in lean women with polycystic ovarian syndrome, we can see the higher waist- hip ratio, greater intra peritoneal and visceral fat.

Exercises and accepting healthy lifestyle created a good body and mental image in the patient that drastically improved which directly showed impact on higher quality of life according to PCOSQ and also there is no marked significance in other outcome measures.

Visceral fat which is seen in normal BMI women's, the visceral fat itself secretes adipokines which impair insulin sensitivity in tissue such as liver and skeletal muscle, insulin resistance is manifested as decrease in glucose transport and decline in muscle glycogen synthesis in response to circulating insulin. In normal BMI women the polycystic ovarian syndrome seen because the connection between the pituitary gland and the ovaries broken down.

Because of the lifestyle modification which include exercise, diet the connection between the pituitary gland and the ovaries reestablished which is helpful for to regulate the menstrual cycle.

In the previous study in polycystic ovary syndrome and weight management the conclusion was prevention from weight gain in normal BMI was crucial component.

And in benefits of short-term structured exercise in non-overweight women with polycystic ovary syndrome: a prospective randomized controlled study the result was after 8 weeks of exercise the gap between the menstrual cycle became shorter and the p value <0.05 which considered as significant.

The participant was given lifestyle modification which included exercise with diet and behavioral management which added plus point in keeping them motivated towards their body image and keep holding their diet by setting different goals and target.

The PCOSQ score is the important outcome measure the p value(<0.0001) which was extremely significant and the paired t test performed the t value was(35.24). BMI was slightly change in the some women's.

Women felt challenging to continue diet and exercises in their routine, which is further challenge to keep going with gained weight. Hence, continuing with lifestyle modification is a challenge and should be kept as long term follow-up, to have good effect.

Conclusion

This study concluded that lifestyle modification for normal BMI PCOS women was effective in maintaining weight and quality of life. The quality of life was improved according to PCOSQ. There by we conclude that lifestyle modification should be the first line treatment for PCOS women.

Conflict of Interest: The authors declare that there is no conflict of interest.

Acknowledement: The authors would like to express their special gratitude towards all the women's that participated in the study. We would also like to thank our families and institution for their everlasting support which enabled us to continue our research activities.

Ethical Cleareance: This study has undergone ethical clearance through the university level ethical committee of Krishna Institute of Medical sciences, Deemed to be University, Karad.

Source of Funding: No funding

Abbreviation:

BMI-Body mass index

W-H Ratio-waist hip ratio

PCOSQ- Polycystic ovarian syndrome questionnaire

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