

Impact of Lifestyle Intervention for Management of the Modern Life Scourge of Polycystic Ovarian Syndrome among Girls – A Case Series

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Abstract

Polycystic ovarian syndrome (PCOS) is a complex endocrine, metabolic and reproductive disorder. It affects various body organs. Oligomenorrhea, hirsutism, insulin resistance, obesity and polycystic ovaries are its hallmark features. Usual medicines for PCOS focus on blood glucose and hormonal regulation. Diet, exercise and lifestyle changes for losing weight provide relief from symptoms. We describe here eight PCOS cases enrolled in an RCT. The study aimed to ascertain the impact of the lifestyle intervention for management of polycystic ovarian syndrome among girls. Anthropometric assessments and biochemical parameters, including reproductive hormones and insulin resistance, were performed at baseline and after 6 months of intervention, change in their health profile was noted. After intervention, menstrual regularity was achieved in all cases. The average weight loss was 4.07 kg (range 2.5–14 kg). The average BMI reduced from 26.6 to 25.0 and waist circumference from 94.1 to 86.6. At the end of the intervention, five cases had normal ovarian size, LH:FSH was normal in three cases. Out of six with insulin resistance, only one tested positive after intervention. One of the subjects said “I am very satisfied with the treatment. Almost all of my problems have been resolved – periods are regular, lab reports are normal, mood has improved, weight has reduced; other people ask me how I have lost weight.” Simple changes in lifestyle can easily provide relief in PCOS cases without any medical intervention.

Keywords: Polycystic ovary syndrome, Infertility, Lifestyle, Adolescent health, Adolescent girls, Oligomenorrhea, Amenorrhea

Introduction

Polycystic ovarian syndrome (PCOS) prevalence is steeply rising. The reported prevalence among adolescents ranges from 9.13% to 36%.¹ PCOS affects various body organs. The features of PCOS include oligomenorrhea/amenorrhea, hirsutism, alopecia, anovulation and polycystic ovaries. All these signs and symptoms may result in psychological issues among PCOS women. Biochemical changes seen among these women are disordered gonadotrophin (LH and FSH), increased

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androgen levels, insulin resistance (IR), chronic low-grade inflammation, etc. If the condition is not treated, it can increase the risk of infertility, diabetes, metabolic syndrome, cardiovascular disease, and endometrial carcinoma.² Obesity and overweight worsen the symptoms of PCOS women. Among PCOS women, obesity and overweight is reported to be 50%–70%. Two-thirds of non-obese PCOS patients have central obesity.³

The etiology behind the disease is still not clear though genetic and environmental factors are considered to be associated with PCOS.⁴

PCOS can be managed but not cured. Management of PCOS includes pharmacological and non-pharmacological treatment. The usual medicines prescribed for PCOS focus on blood glucose and hormonal regulation. The most common medicines include birth control pills, clomiphene citrate, metformin, etc. Unfortunately, these are not fully able to deal with all the metabolic parameters. Rather these may have their own negative effects.⁵

As per PCOS treatment guidelines, the first line of treatment for its management includes lifestyle modification. However, the emphasis these days is on pharmacological treatment.

Lifestyle modification can be a key intervention to improve quality of life of PCOS cases. Diet modification, increased physical activity, and stress management can do wonders. Losing weight (even 5%–10%) provides relief from symptoms. Studies have proven efficacy of high protein and complex carbohydrate diets along with exercise in improving this condition.^{6,7}

Lifestyle interventions (diet and exercise) are recommended as first-line treatment for PCOS management.⁸ Lifestyle interventions are cost-effective strategies compared to pharmacological options. Lifestyle intervention has led to reduction in weight and improvement in symptoms of PCOS.⁹

Despite such evidence, majority of the PCOS girls do not avail the benefits of following a healthy lifestyle. The possible reason could be lack of effective communication regarding the importance of a healthy lifestyle. The medical fraternity in OPDs does not have ample time to counsel the affected women due to overcrowded OPDs. There is a need to empower PCOS women for self-management through lifestyle modification. This can only be achieved by offering laidback counselling sessions to affected women. This idea has been successfully implemented by the authors by establishing a separate multipurpose behavior therapy/counselling room in gynecology OPD of PGIMER, Chandigarh.

Based on the concept of health promotion and de-medicalization, a multi-purpose behavior therapy (MPBT) room was established in the Gynecology OPD of

a tertiary care hospital and research institute of north India in November 2012. So far, >5000 patients have been counselled successfully. This room caters to the cases of urinary incontinence, prolapsed, dysmenorrhea, menopause, infertility, ANC and PNCs, and obesity. Many patients (62.5%) reported benefit from counseling. Around 2700 ANC patients counselled in MPBT room have reported relief in symptoms and satisfaction with the quality of counselling as denoted by their response – *“Hamare time to koi aise nahin batata tha...aap ki kismat achchhi hai ki aap ko yahan inki advice mil rahi hai. Isse achchhe se maan lo”* (Nobody guided us in our pregnancy. You are lucky to be counseled like this here. Follow their advice religiously).¹⁰

Here, patients referred by the specialists are counselled regarding self-care/behavior therapy (weight reduction and nutritional advice). Husbands and mothers/mothers-in-law are also counselled along with the patients. Behavior therapy was effective in relieving reproductive health symptoms of women. It is feasible to introduce health promotion orientation in OBG OPD for enhancing patient satisfaction. The latest addition to this approach is the use of mobile phone/laptop for video-based counselling in MPBT room.

A similar approach was applied to resolve the problem of women with PCOS by non-medicinal interventions. There was a need to standardize a package of intervention for PCOS patients attending MPBT room. This package seeks to improve management of women having PCOS.

Thus, the aim of this investigation was to see the efficacy of the lifestyle intervention package in management of polycystic ovarian syndrome cases.

Methodology

The cases for the study were recruited from gynecology OPD, PGIMER, Chandigarh. Eight cases were recruited for the intervention, after physician approval. All were diagnosed PCOS cases (as per the Rotterdam criteria),¹¹ age 18–35 years and were willing to provide informed consent and visit hospital for follow up. Women currently on oral contraceptives or other medications, pregnant, lactating women and those with any pre-existing condition (DM, thyroid, CAD, abnormal creatinine levels, liver dysfunction, and hyper-prolactemia) were excluded.

Clearance for the study was obtained from the ethics committee of PGIMER. Written informed consent was obtained from participants of the study. The intervention was for six months and follow-up visits were planned every month.

The following parameters were studied before and after the intervention:

- Reproductive factors – Menstrual regularity

- Anthropometric factors – Weight, BMI, waist circumference, waist-to-hip ratio
- Metabolic parameters – Fasting glucose, insulin resistance
- Hormonal parameters – LH, FSH, testosterone, DHEAS
- UGG – Volume of ovaries

A pre-tested questionnaire was used for data collection. It emphasized on menstrual regularity, hirsutism and acne, gynecological history, and medications. Relevant family history was elicited from the patients.

Weight was measured (in kg) using the digital weighing scale for pre- and post-readings. Stature was measured (in cm) using a stadiometer. Body mass index (BMI) was calculated using the formula: $BMI = \text{Kg}/\text{m}^2$. Waist circumference was taken at midway between the lowest rib margin and iliac crest. Hip circumference was measured at the point of greatest circumference around hips. Waist to-hip ratio was calculated as waist circumference divided by hip circumference. Excess androgen was calculated using modified *Ferriman-Gallwey (mF-G)* method.

WHO Asia Pacific classification BMI of 18.5–22.9 is classified as normal weight, BMI of 23–24.9 is overweight, BMI of 25–29.9 is obese I and BMI of ≥ 30 is considered obese II.

All girls were asked to come for laboratory assessment. Fasting sample of venous blood (mL) was drawn in the early follicular phase of the menstrual cycle. Hormone estimates included luteinizing hormone (LH), follicle-stimulating hormone (FSH), total testosterone, and prolactin was done by fully automated bi-directionally interfaced chemiluminescent immunoassay. Ultrasensitive sandwich chemiluminescent immunoassay was used to measure thyroid stimulating hormone (TSH). Homeostasis model assessment (HOMA) method was used to measure insulin resistance. HOMA was derived using the formula: $\text{Glucose} * \text{Insulin} / 22.5$ (when glucose is in molar units mmol/L). Glucose was measured using the enzymatic calorimetric method. Pelvis ultrasonography was performed by a certified ultrasonologist.

Intervention

The study intervention included counselling sessions for:

- Conventional healthy diet with the macronutrient composition (carb:fat:protein=45–50: 30:20–25). Emphasis was given on complex carbohydrates
- Exercising schedule
- Meditation – Deep breathing exercise thrice a week
- Sleep at least 6–8 hours
- Maintaining adherence diary

Results

The eight cases had confirmed diagnosis of PCOS. Their age

was 20–29 years. Average height of the cases was 155.56 cm and the weight was 64.44 ± 13.52 kg. The mean BMI was 26.65 and SD 5.11. Two of the cases were normal weight, two were overweight, two were obese grade I, and two were obese grade II. The mean waist circumference was 94.06 ± 13.76 and waist-to-hip ratio 0.92 ± 0.05 . All the eight had irregular menstrual cycle and polycystic ovaries (PCO). Altered LH:FSH ratio was present in five of the cases. Only two had high testosterone levels. Mean DHEAS value was 209.94 and FBS was 87.59 in the beginning.

After six months of treatment, the average weight reduced to 60.37 ± 10.57 . Two overweight became normal weight, and one obese grade II case after losing weight became obese grade I. The mean waist circumference dropped to 86.62 ± 13.02 . Waist-to-hip ratio was 0.88 ± 0.07 . Mid-arm circumference reduced from 29.25 ± 3.74 to 28.44 ± 3.49 . Polycystic ovaries (PCOs) were present only in three cases and five had no PCOs. After treatment, four cases had normal LH:FSH and only one was left with abnormal ratio. FBS after intervention mean value reduced to 84.49, while DHEAS values increased to 259.56. Earlier six patients had insulin resistance but after six months, only one case was found to be insulin resistant. Menstrual regularity was achieved in all cases.

One of the subjects said “I am very satisfied with the treatment. Almost all of my problems have been resolved – periods are regular, lab reports are normal, mood has improved. Weight has reduced; other people ask me how I have lost weight.”

Another patient said, *In these six months, i have noticed a lot of improvement in my lifestyle. I learnt how important it is to eat on time and in moderation. I feel more confident. Overall, I feel much improvement in myself. The third patient said, “Lifestyle modification helped me a lot in solving my menstrual problem. Now I get regular periods without any medicines.*

Conclusion

Simple changes in lifestyle can help patients easily manage PCOS themselves. In the 8 cases reported here, regular menstruation was achieved by lifestyle modification. The average weight loss was 4.07 kg (range 2.5–14 kg). The average BMI reduced from 26.65 ± 5.11 to 25.0 ± 3.49 and waist circumference from 94.06 ± 13.76 to 86.62 ± 13.02 . At the end of the intervention, five cases had normal ovarian size and LH:FSH was normal in three cases. Out of six with insulin resistance, only one tested positive after intervention.

Thus, there is a need to increase the use of counselling-based approach in OBG OPDs for management of PCOS through healthy lifestyle modification.

Conflict of Interest: None

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