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Exploration and Understanding of Lifestyle Modification with Conservative Treatment in Polycystic Ovarian Syndrome among Females Seeking Management for Primary Infertility

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ABSTRACT

Introduction: PCOS is a major endocrinological syndrome that affects females and impairs hormonal stability thus having an impact on the normal functioning of some body systems. This has affected 6-20% of the female population min reproductive age and hence its diagnosis is important.

Methods: This is a prospective cohort study. A total of 151 females were enrolled, asked about menstruation history, signs and symptoms of polycystic ovarian disease, and reproductive health. Educated about weight loss, lifestyle modifications, and initiated consulted first-line conservative treatment, all the aspects were reevaluated after 4 months for results. The data was analyzed in the statistical package of social sciences (SPSS) version 2021.

Result: Lifestyle preferences indicated low to none physical activity and increased basal metabolic index in 85.4% of study participants, 60.9% were facing irregular periods, heavy bleeding was experienced by 16.6% participants.. 41.7% knew that lifestyle modification can help reduce adverse effects of the syndrome. After lifestyle modification, 68.9% indicated menstruation regularity, and 64.9% conceived without any medical intervention. Overall 79.5% of improvement in symptoms was recorded after the intervention, a total of 23.7% were taking medicines for insulin resistance, and 53.5% had a positive family history of diabetes and obesity.

Conclusion: Lifestyle choices adopted by childbearing-aged females of Pakistan may predispose them to disorders including PCOS and infertility, early detection, proper management, and lifestyle modification including weight reduction, lower stress, and healthy diet improved menstruation regularity, and participants conceived without medical intervention.

Key words: Lifestyle Modification, Polycystic ovarian syndrome

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INTRODUCTION

Polycystic ovarian syndrome is an endocrinological impairment that affects 6-20% of women of Reproductive age ranging from 15 years to 49 years, making it the most debatable gynaecological disorder in the developing world [1]. In this syndrome, the usual levels and functions of hormones are constantly impaired which affect ovaries and maintenance of regular menstrual cycles [2]. Polycystic ovarian syndrome (PCOS) is widespread globally; In Pakistan, the prevalence rate has been recorded as 52%, the reason behind higher incidence rates are late detection of disease, rare medical follow-up and decreased knowledge of lifestyle modification impact. the prevalence of PCOS in western countries are notably low, 20-25% in the United Kingdom and 4-12% in the united

states [3], The awareness of PCOS and its associated risk factors are low, in the US 7 million women with PCOS only half of them is mindful that they have this syndrome. Insufficient knowledge leads to the progression of disease and late diagnosis, the young Pakistani female population has little awareness regarding this syndrome, 22% rise in incidences has been recorded in the past 05 years [4]. Hereditary factors, environmental factors, and consanguineous marriage can be the reason behind the escalating occurrence of PCOS [5]. The ultimate reason behind infertility is raised androgen and luteinizing hormone levels and PCOS is currently the leading cause of infertility in women. It is further characterized by irregular menstrual cycles, hirsutism, acne & seborrhea [6,7] PCOS is related remarkably with BMI indicating obesity, paired with dysglycemia, DM type 2, and metabolic syndrome still it is not diagnosed thus restricting the chances of precautionary majors and its management [8-10]. 30% to 40% of women who are suffering from PCOS have glucose intolerance and are unresponsive to the insulin that causes hyperinsulinaemia via feedback mechanism as body's response to regulate blood glucose levels and approximately 10% are prone to have insulin-independent diabetes in their 40s [11]. It is commonly observed as being the potent instigator of impaired glucose tolerance, elevated insulin levels, heart disease, and high blood pressure. The occurrence of surplus weight in PCOS lies in the span of 30-75% and fattening up has detrimental effects on individuals and their symptoms are exacerbated [12] also expected to increase the possibility of cardio metabolic disorders, as significant half of the population of females with PCOS are obese. Hormonal imbalance in PCOS lays its effects on the psychological wellbeing of a person and thus affects the quality of life. Psychological impairment manifests as depression, anxiety, stress, low self-esteem, negative body image & psychosexual dysfunction. The occurrence of endometrial cancer increases three folds in individuals with PCOS [13]. Wide range of treatment options has been evaluated for PCOS, including lifestyle modification [14], weight reduction [15] to conservative management with decreasing symptoms of PCOS, metformin for insulin resistance and folic acid, inositol intake for better ovum quality [16]. Ovulation induction for ovulatory patients with clomiphene citrate and letrozole are popular too. Invasive treatment options range from cyst excision to enhance ovulation chances and intrauterine insemination (IUI), to in-vitro fertilization (IVF) [17].

This study aims to assess the effect of lifestyle modification, weight reduction, stress reduction, and healthy diet along with first-line conservative management in diagnosed polycystic ovarian syndrome patients, upon polycystic ovarian syndrome symptoms, infertility, and quality of life.

METHOD

This is a cross-sectional, cohort study; the survey continued for 3 months ranging from August2021 till October 2021, 151 females diagnosed with polycystic ovarian syndrome and seeking treatment for primary infertility were enrolled in the study. After signing informed consent, demographic data was gathered by a prestructured validated questionnaire, The questionnaire contains two different sections, section A has Demographic questions including Age, weight, basal metabolic index, duration of PCOS diagnosis, duration of infertility, medical history, and lifestyle pattern, while Section B contains questions about details of the menstrual history and PCOS symptoms and perceived stress access to evaluate stress severity of study participants. Upon consultation with a consultant gynaecologist, patients were prescribed first-line conservative treatment, nutritionist counselled for healthy diet pattern and primary investigator educated the participants about lifestyle modification, stress reduction, and weight reduction. After 3 months of consecutive communication, patients were asked to visit outpatient department again, results were compared after three months. Successful weight reduction, declining of symptoms, improvement in menstrual regularity, and conception was analyzed. The data were analyzed in a statistical package of social sciences (SPSS) version 2021.Demographic detail such as age weight height and BMI are analyzed as descriptive variables and interpreted in mean and standard deviation methods. Independent variables were analyzed in frequencies and percentages. To compare the pre-intervention and post-intervention paired sample t-test and multivariate regression was performed, the significance of data was analyzed with chi-square test, p-value<0.05 considered significant.

RESULTS

The mean age value of the participants is 22.2 ± 1.9 years. Upon enrolment, the medical history including age at menarche, and duration of infertility explained as the duration of trying to conceive or having unprotected sex was asked and meantime was 2.5 ± 0.8 years and mean age at menarche was 11.5 ± 4.8 years, while the duration of PCOS diagnosis was 1.2 ± 0.4 years. After diagnosis, consultant health care provider prescribed conservative first-line treatment, every patient was recommended to take 400µcg of folic acid once a day, only134 (88.7%) were prescribed to take metformin (1000-1500mg /day), Inositol was prescribed to 71 (47%) participants while only 48 (31.7%) females were requested to take Progesterone to get menstrual cycle after 3 months of absence. Other than medical advice, a few recommendations were to reduce weight, enhance physical activity with mild exercise and improve diet patterns and food choices to participants after detailed consultation. A psychological assessment for stress was taken, perceived stress scale was used to assess the severity of stress in study participants, 73 (48.3%) indicated mild stress, while 41 (27.1%) showed signs of moderate stress, only 7 (4.6%) showed severe stress symptoms and referred to a psychologist for consultation. Mild and moderate stress indicated participants were educated for stress management and perception management for better-coping skills (Table1).

Polycystic ovarian syndrome has specific symptoms, including irregular menstrual cycle, excessive bleeding during menstruation, patches of dark skin, acne, and excessive body hair growth, these symptoms have been indicated by our study participants as 98 (64.9%), 38 (25.1%), 42(27.8%), 48(31.7%) and 72(47.6%) respectively. While after intervention the follow up results showed significant decline in symptoms with 21 (13.9%), 17 (11.2%), 33 (21.8%), 29(19.2%) and 56 (37%) of frequency respectively (Figure 1). Overall, 132(56%) of reduction in PCOS symptoms have been recorded with 104 (44%) menstrual regularity after the intervention (Figure 2). Details of pre-intervention and post-intervention differences are significant, weight reduction showed a mean value of 32.3kgs loss with a positive association with symptoms of the polycystic ovarian syndrome, mean basal metabolic index difference was 4.4, while stress difference was remarkable after the intervention, indicating 24 participants from mild stress, 20 participants from moderate stress and 5 from severe stress with the association of all variables were positive. Upon intervention with conservative management including metformin, ovulation induction and weight reduction, successful conception was recorded in 98 (64.9%) of study participants (Table 2 and Figure 3).

Association of recommended adaptations and conservative management with successful conception indicated that metformin increases the chances of conception by 3.4 folds, although inositol doesn't have a positive association. Weight reduction also showed significant improvement in conception along with enhancing physical activities mildly, diet improvement doesn't show a positive association (Table 3).

Table 1: Descriptive details of study participants.

Variables		Mean SD/n(%)
Descriptives and Diagnosis	Age (years)	22.2 ± 1.9
	Menarche age (years)	11.5 ± 4.8
	Duration of infertility (years)	1.5 ± 0.8
	Duration of PCOS diagnosis (years)	1.2 ± 0.4
Medication	Folic acid	151 (100%)
	Metformin	134 (88.7%)
	Inositol	71 (47%)
	Progestrone	48(31.7%)
Recommendation	Weight reduction	92 (60.9%)
	Exercise (Mild)	127 (84.1%)
	Diet improvement	142 (94%)
Stress evaluation	Mild stress	73 (48.03%)
	Moderate stress	41 (27.1%)
	Severe stress	7 (4.6%)

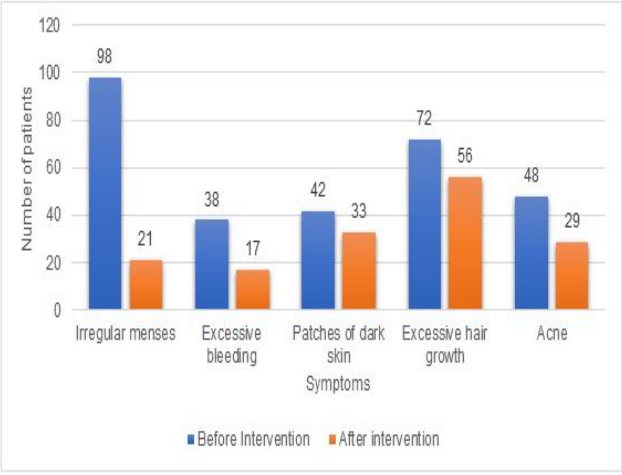

Figure 1: Frequency of PCOS symptoms before and after the intervention.

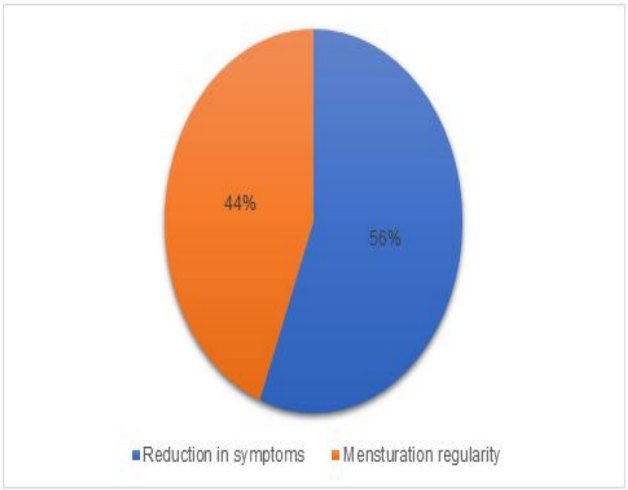

Figure 2: Overall reduction of symptoms post-intervention.

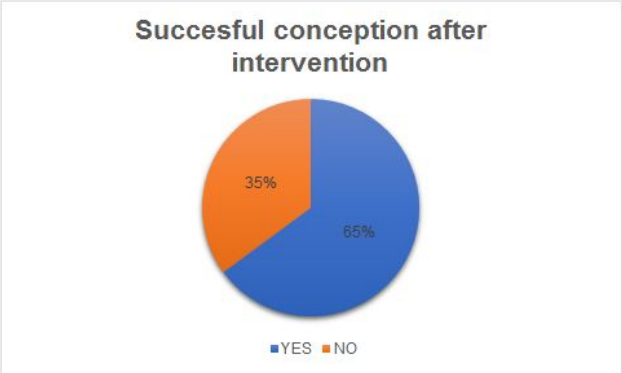

Figure 3: Frequency of successful conception.

Table 2: Difference between pre-intervention and post-intervention.

Variables	Pre-intervention	Post-intervention	P-Value	Odds Ratio (95% CI)
Weight (kg)	124.4 ± 9.0	92.1 ± 8.6	0.02	4.1 (2.5-12.9)
BMI	28.9 ± 4.8	24.5 ± 1.8	0.05	2.3 (1.8-5.4)
Mild stress	73 (48.03%)	49 (32.4%)	0.04	1.3 (0.4-3.4)
Moderate stress	41 (27.1%)	21 (13.9%)	0.09	1.7 (0.5-1.8)
Severe stress	7 (4.6%)	2 (1.9%)	0.03	1.2 (0.7-2.1)

Table 3: Association of lifestyle modification along with conservative management on conception chances.

Successful conception after conservative medication			
Variables		Results n(%)	Odds Ratio (95% CI)
Medication	Metformin	42 (27.8%)	3.4 (1.8-6.7)
	Inositol	8 (5.2%)	0.9 (0.2-1.2)
Recommendation	Weight reduction	29 (19.2%)	2.8 (0.9-4.2)
	Exercise (Mild)	9 (5.9%)	1.1 (0.5-2.8)
	Diet improvement	4 (2.6%)	0.8 (0.1-1.7)
	Stress managemnt	6 (3.9%)	1.4 (0.8-3.4)

DISCUSSION

Lifestyle modification reduces the polycystic ovarian symptoms including irregular menstruation, acne, and other related issues, and enhances the chances of conception, our study results showed significant improvement in symptoms including menstrual disturbances by 44%, while excessive blood flow during menstruation was reduced by 21, another study with similar progressive results indicated that overall lifestyle modification has a positive impact on polycystic ovarian syndrome symptoms [18-20]. Metformin increases the chances of fertility by 3.4% in study participants diagnosed with PCOS along with insulin resistance, these results have been evaluated before and indicated a positive impact of metformin as the drug of choice in many PCOS patients, metformin is known to reduce weight and regulate menstruation by managing blood glucose level [21,22]. Although the effect of inositol on the fertility of PCOS patients is still not completely evaluated, a few studies supported the treatment [23] our study results indicated a negative association of inositol treatment on fertility, the reason could be the severity of symptoms of PCOS and/or stress levels. The impact of perceived stress upon PCOS symptoms, Quality of life, and fertility have been explained in many studies, the fact that managing stress enhances the chances of fertility in females diagnosed with PCOS is known and present in literature [24], our study participants were evaluated for stress and counselled to manage stress and work on their coping skill, the fertility was enhanced in 3.9% of participants by managing stress only. Mild physical activities including exercise and weight reduction have a significant effect on fertility of PCOS patients and reduction in symptoms, importance, and methods of weight reduction were counselled to study participants and results indicated significant improvement in fertility with 19.2% inspection overall. The body fat and increased basal metabolic index is known risk factors to reduce fertility and disturb menstruation in females not diagnosed with PCOS, with PCOS diagnosis the risk enhances by2 folds [25-27]. Diet improvement has no positive effect on the fertility of

study participants, the reason could be financial difficulties. A significant difference was noted after intervention in weight, BMI, and stress severity of study participants, indicating adaptation of females towards a better lifestyle and accepting the effect of lifestyle modification upon PCOS and fertility issues, the improvement after counselling has been noted after three months and indicated positive results specifically insight reduction and stress management, although diet pattern was not been followed by many participants. Previous studies have been evaluated the improvement after intervention on weight reduction and stress levels separately [28,29]. For male infertility the importance of weight management and stress management has also been evaluated and results described the vital part of stress management upon sperm quality, for females stress is known to reduce ovulation and fertilization. 98(64.9%) out of 151 study participants showed positive conception after the intervention, the results are similar to other studies conducted in other regions with 60%, 71%, and 81% of positive conception without any invasive intervention [30-32]. Limitations of the study are small sample size, with only three months of follow up, also patients were from middle socioeconomic class, studies with randomization of lifestyle modification and conservative management with metformin and ovulation induction in large sample size involving more than two socio-economic classes is recommended.

CONCLUSION

In our study, we concluded that weight reduction and stress management has a positive effect on PCOS symptoms management and increase the chances of conception. Conservative management of PCOS with metformin and ovulation induction can be a burden financially and emotionally for many females, lifestyle modification should be the first-line option to manage PCOS and fertility along with stress severity identification and management.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

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