

Fertility problems in women with polycystic ovary syndrome

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ABSTRACT

Background: PCOS (Poly Cystic Ovary Syndrome) is the most common endocrine disorder in women of reproductive age with high prevalence. It is a leading cause of infertility in women; this draws an attention to this issue. In this study we aimed to know the prevalence, clinical features, fertility problems and management of PCOS.

Methods: In this prospective observational study, women who consulted Obstetrics & Gynaecology department were screened to identify the PCOS problems through clinical histories, PCOS questionnaire and ultrasonography over a period of 6 months at Rajiv Gandhi institute of medical sciences (RIMS) in Kadapa, India. Patients diagnosed with PCOS were assessed for their clinical manifestations, severity, life style and treatment given, and were educated accordingly through patient counselling and leaflets.

Results: We observed 6.39 % prevalence out of 970 women. 59 (95.1%) patients were complained irregular menstrual cycles. Infertility was significantly high in PCOS women i.e. 13.35%. 64.4% of PCOS patients had miscarriages.

Conclusions: PCOS is a complex condition with high prevalence of fertility problems, needing due attention. There is need to create attentiveness towards this issue. Early diagnosis and proper management with appropriate medicines and lifestyle modifications will improve the condition and prevents complications.

Keywords: Polycystic ovarian syndrome, Menstrual irregularity, Infertility, Patient counselling, Questionnaire

INTRODUCTION

Poly Cystic Ovary Syndrome (PCOS) stands as one of the frequently occurring endocrinopathies in women of reproductive age with the incidence rate of 5-10% worldwide.¹

PCOS is named as “Stein-Leventhal syndrome” after its earliest recognition by Drs Stein and Leventhal. They described it as a syndrome of polycystic ovaries, with systemic reproductive, metabolic and psychological disturbances.²

PCOS is mainly presented as anovulation and hyperandrogenism,³ the clinical presentation of this syndrome including its severity may vary from one woman to another and no two women shows exactly the same symptoms.⁴

The characteristics which are very often associated with PCOS, but not all are seen in every woman are reproductive problems like, infertility (not able to get pregnant) because of anovulation, absent or irregular menstrual periods, cysts on the ovaries and pelvic pain. Dermatological and hyperandrogenic features like, hirsutism - increased hair growth on the face, chest,

stomach, back, thumbs, or toes, acne, oily skin or dandruff, patches of skin on the neck, arms, breasts, or thighs that are thick and dark brown or black, skin tags - excess flaps of skin in the armpits or neck area, male-pattern baldness or thinning hair. Others problems like lipid abnormalities (Weight gain or obesity, usually with extra weight around the waist), mental health issues (Anxiety or depression) and sleep apnea.⁵

A complete understanding of the underlying pathophysiology of PCOS is still lacking. Because of the heterogeneity of this disorder, there are most likely multiple underlying pathophysiological mechanisms.⁶

There is no single definitive test to diagnose Poly Cystic Ovary Syndrome (PCOS). PCOS is generally diagnosed based on medical history, physical exam, ultrasound of the ovaries, and the results of blood tests. Poly Cystic Ovary Syndrome (PCOS) is associated with increased risk for endometrial cancer, infertility, diabetes, high blood pressure, and heart disease. Women with PCOS may have trouble becoming pregnant due to infrequent or absent ovulation. Follicles are sacs within the ovaries that contain eggs. In PCOS, there are many poorly developed follicles in the ovaries. The eggs in these follicles do not mature and therefore cannot be released from the ovaries during each menstrual cycle. Instead, they may form very small cysts in the ovary. Early treatment of PCOS may prevent infertility or increase the chance of having a healthy pregnancy.⁷

Aim

To identify and assess the clinical characteristics, fertility problems of women with PCOS

Objectives

1. To estimate the prevalence of PCOS.
2. To study the clinical characteristics of PCOS patients.
3. Finding risk factors of patients and educating them regarding the risk/complications.
4. To create awareness regarding PCOS and educating patients regarding life style modifications, diet and exercises to be followed.
5. To assess the available therapeutic plans for PCOS.

Source of data

This consists of female patients attending the gynaecology outpatient department from December 2013 to May 2014 at Rajiv Gandhi Institute of Medical Sciences (RIMS), Kadapa. We have obtained the ICF from those who are willing to participate in study. All the necessary and relevant baseline information was collected

on a "Patient data collection form". We studied the outcome of pregnancy in patients who were diagnosed with PCOS.

METHODS

Patients were enrolled in the study based on the inclusion and exclusion criteria. Women ≥ 18 years and the PCOS patients were included in the study. Young women who had their menarche less than 3 years were excluded from the study.

A prospective observational study was conducted for six months duration (November-May 2014) in the Gynaecology unit at Rajiv Gandhi Institute of Medical Sciences, Kadapa.

Based on the inclusion and exclusion criteria, the polycystic ovarian syndrome patients were recruited in the study. We have obtained the ICF from those who are willing to participate in study.

All the necessary and relevant baseline information were collected on a "Patient data collection form", which includes patient demographics like age, socio-economic status, family income, occupation and educational status. General information like weight (present & 1 year ago), medical history, medications & supplements, daily routines, life style pattern, Allergies & habits, family medical history, clinical features like hirsutism, acne, and acanthosis nigricans, menstrual history like number of cycles per year and last menstrual period. Patient information leaflet was provided and educated accordingly.

The following principles were applied in identifying and recruiting the PCOS women:

Rotterdam criteria

- i. Oligo-or anovulation
- ii. Clinical (hirsutism, acne or androgenic alopecia)
- iii. Polycystic ovaries on ultrasound examination.

PCOS questionnaire score

A structured questionnaire was applied to assess the risk of women based on their:

- i. Menstrual irregularities
- ii. Skin problems
- iii. Weight gain and insulin - based problems

Based on the answers given by the women to the questions in the questionnaire they were given score accordingly.

Statistical analysis

The percentage method was used to analyze the patient distribution based on various parameters. The appropriate statistical parameters were used to calculate the prevalence of PCOS. The statistical parameters like mean, standard deviation were considered to analyze the patient age & weight distribution.

RESULTS

During this study period around 970 women were consulted gynaecology O.P department, out of which 277 patients who have symptoms similar to PCOS were screened and only 62 patients were confirmed with PCOS through symptomology and USG abdomen. Table 1 represents the demographic details of patients according to each variable.

Table 1: Demographics of the PCOS patients.

Characteristics	Category	No. of patents	Percentage (%)
Age (years)	18-28	41	66.1
	29-38	19	30.6
	39-45	2	3.22
Marital status	Married	43	69.3
	Unmarried	17	27.4
	Divorced	2	3.22
Weight (kg)	41-50	4	6.45
	51-60	20	32.25
	61-70	26	41.93
	71-80	7	11.29
	81-90	5	8.06
Child history	Having children	21	46.6
	Not having children	24	53.4

The prevalence of PCOS was found to be 6.39%.

The age group of patients diagnosed with PCOS is ranging from 18-45 years. Among 62 patients diagnosed with PCOS 41 were in the age group 18-28, 19 were in the age group 29-38, 2 were in the age group 39-45.

In a total of 62 PCOS patients, 69.3% were married, 27.4% were unmarried & 3.22% were divorced.

42% of patients were in between 61-70 kg's, 32% in between 51-60 kg's, 11% in between 71- 80 kg's, 8% in between 81-90 kg's and 6% were in between 41-50 kg's. Mean body weight (kg) of patients (n=62) was 62.4 ± 12.8, mean height (cm) is 159.6 ± 5.74 and mean BMI (kg/m²) of women with PCOS is 23.52 ± 3.85 (Table. 2).

Among the 62 patients 5 (8.06%) women have the habit of regular exercise and 57 (91.9%) women leading sedentary life style.

Table 2: BMI of the women with PCOS.

Characteristics	Mean ± SD
Height (cm)	159.6 ± 5.74
Weight (kg)	62.4 ± 12.8
BMI (kg/m ²)	23.52 ± 3.85

We assessed the women by using PCOS Questionnaire. Figure 1 depicts the questionnaire score among women. According to the questionnaire 48 patients were found to be at high risk for PCOS their score range is in between 5-9, 8 patients were confirmed to have PCOS with score range in between 10-15.

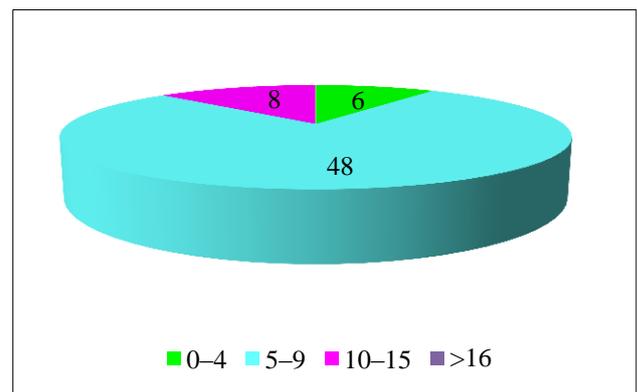


Figure 1: PCOS questionnaire score of the patient.

Out of 62 PCOS patients 59 (95.1%) patients were complained irregular menstrual cycles. 3 (4.83%) patients were not having this problem (Figure 2).

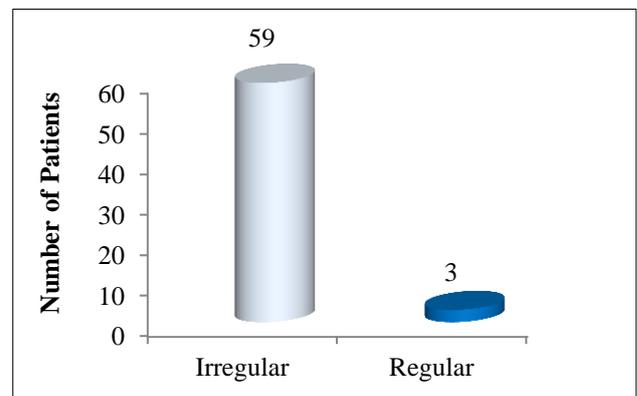


Figure 2: Menstrual history of the patients.

Women were complaining of other manifestation of PCOS (Figure 3) such as ovarian cysts, hair loss 77 %, weight gain 69%, acanthosis nigricans 64 %, hirsutism 55%, depression 53%, and acne 50%, followed by other symptoms.

Among 45 married women 21 (46.6%) were having children and 24 (53.4 %) were in agony of childlessness. Table 3 illustrates the obstetric history of the women.

Among the 45 married patients, 13 patients had single pregnancy, 20 patients had 2 pregnancies, 6 patients had 3 pregnancies and 6 had no pregnancies. 15 patients had 1 live birth, 7 patients had 2 live births, 1 patient had 3 live births and 22 patients had no live births. 21 patients had 1 miscarriage, 8 patients had 2 miscarriages, and 16 patients had no miscarriages, 2 patients had 1 abortion.

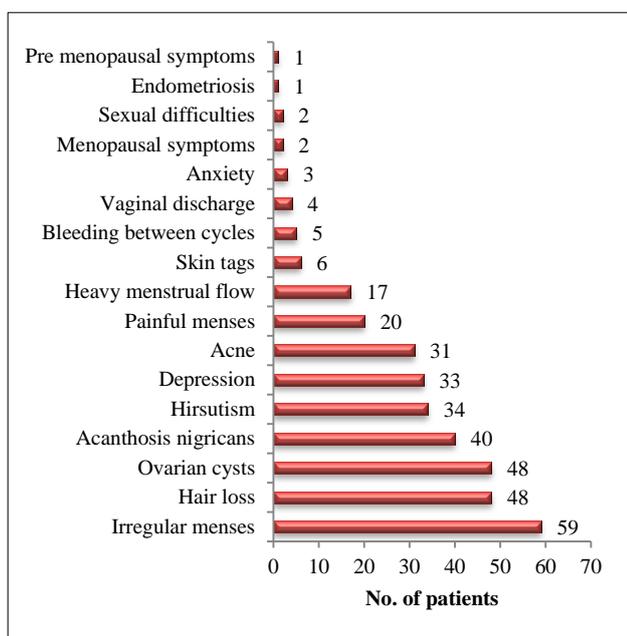


Figure 3: Clinical manifestations of PCOS patients.

Table 3: Gestational histories of the patients.

Characteristics	Number	No. of patients	Percentage (%)
Gestations	0	6	13.35
	1	13	28.88
	2	20	44.44
	3	6	13.33
Live births	0	22	48.88
	1	15	33.33
	2	7	15.55
	3	1	2.22
Miscarriages	0	16	35.55
	1	21	46.66
	2	8	17.77
	3	0	0
Abortions	0	43	95.5
	1	2	4.44
	2	0	0
	3	0	0

In our study, metformin therapy is given for 18 patients, metoxy progesterone therapy is given for 14 patients, ethinyl estradiol therapy is given for 9 patients and some other treatments were recommended in 21 patients (Figure 4).

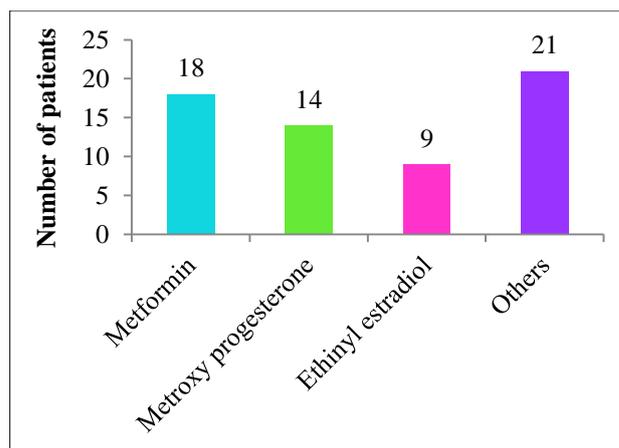


Figure 4: Prescribed therapies for PCOS women.

DISCUSSION

Polycystic ovarian syndrome is a group of disorder which affects the women, the main complications of PCOS are infertility, cardiovascular problems, obesity etc. The occurrence of PCOS is rapidly increasing these days may be due to changes in living pattern, sedentary life style, changes in diet pattern, genetic behaviour etc.

Out of 277 patients examined 62 showed positive results for PCOS according to Rotterdam criteria and PCOS questionnaire. The estimated prevalence rate was 6.39% which was very close to the study of Ligia G et al.⁸ (8.5%), Samar M et al.⁹ (7.3%), Fahimeh R et al.¹⁰ (7.1%), Susan M et al.¹¹ (4-8%), Howard A et al.¹² (4%), Saghar S et al.¹³ (3.42%), Wendy A et al.¹⁴ (0.2 ± 2.2%) while Zahida B et al.³ (40.9%) showed the highest percentage of prevalence.

Generally, PCOS will occur only at reproductive age and the same was observed in our study, which is matched with other studies Samar M et al.⁹ (20.2 ± 1.4), Zahida B et al.³ (27 ± 8), Ligia G et al.⁸ (30.7 ± 7.2), Fahimeh R et al.¹⁰ (34.4).

The proportion of marital status of PCOS women in our study correlates with the study of Ligia G et al.⁸ (65.8%). The occurrence of PCOS is more in married women may be due to increased stress and lack of awareness about PCOS.

Due to high androgen content in PCOS women anovulation occurs, it may lead to difficulty in conceiving and as a result women become infertile. The main consequence of PCOS is infertility and our results shows that 53.4% of women were suffering with fertility problems due to PCOS, these results correlate with the studies of Wendy A et al.¹⁴ (54.6%), Susan M et al.¹¹ (40%), Kristi P et al.¹⁵ (56%).

The weight of the patients is the key point in PCOS. The mean weight of PCOS women included in our study is comparable with mean weight of the studies of Wendy A

et al.¹⁴ (72.1), Ligia G et al.⁸ (60.9), Samar M et al.⁹ (60.19 ± 10.14), and 91.9% patients are leading sedentary life these are the most alarming issues in PCOS. The mean BMI of patients included in the study is 23.52 ± 3.82 which indicates that majority of women included were overweight (23-25 kg/m²). Increase in weight will cause some physiological changes in women by increasing in cholesterol level, which will increase androgen production which further produces male pattern characteristics, anovulation, miscarriages, or late pregnancy complications etc. Weight loss improves SHBG (sex hormone binding globulin) concentrations, decreases testosterone and improves menstrual function and conception rates. It will also improve insulin sensitivity.

Menstrual irregularity is one of the main symptom of PCOS and affects majority of the patients and same was observed in our study population and it correlates with the studies of Geetha K et al.¹⁶ (72%), Susan M et al.¹¹ (85%-90%), Ligia G et al.⁸ (98.6).

Mostly presented symptoms are irregular menses, acne, hirsutism, hair loss, depression, acanthosis nigricans, ovarian cyst, bleeding between cycles, skin tags. In the study of Geetha K et al.¹⁶ the occurrence of acne (20%), Hirsutism (28%), irregular menses (72%). In another study of Ligia G et al.⁸ the percentage of acne (5.5%), Hirsutism (79.5%) and irregular menses (96.3%).

PCOS is confirmed by using standard questionnaire and USG abdomen, 77.4% patients scored in between 5-9 indicates the possibility of PCOS but these patients were confirmed through USG abdomen, 12.9% of patients scored in between 10-15 indicates these patients need intensive therapy to manage their condition.

PCOS mainly causes infertility and if conceived also makes the women unable to maintain pregnancy. Obstetric history of women in our study revealed that about 46.66% of patients had a history of at least a single miscarriage which is analogous to the study of Geetha K et al.¹⁶ (34%),

Treatment for PCOS includes hormonal therapy, anti-androgen drugs; anti-diabetic drugs etc. Majority of patients were prescribed hormonal therapy which is a first line therapy for PCOS, of patients followed by metformin, this indicates that the most of the patients are showing insulin resistance, which is the important sign of PCOS, others were received therapy according to their clinical manifestations. These results are similar with the studies of Geetha K et al.,¹⁶ Metformin therapy (20%), ethinyl estradiol (10%), medroxy progesterone acetate (10%) and other treatments (13%).

The treatment of PCOS includes modifications in life style along with medical treatment. And so we educated and provided each patient with leaflet having recommendation regarding diet and exercise as following

these changes will increase the likelihood of ovulation and pregnancy and prevent further complications.

CONCLUSION

PCOS is not a single disease it is a group of several disorders, despite of its high prevalence; this syndrome has not been widely studied. Most of the conducted studies have enrolled small samples within a short time period.

PCOS is associated with reproductive and cardiovascular complications in women which mainly affects the fertility of female patients. It is probably the most common cause of anovulatory infertility associated with an increased risk of miscarriages.

Healthcare professionals plays vital role in the management and prevention of PCOS, who has to educate patients regarding the disease and its complications, importance of strict life style modifications will help in reducing the incidence and severity of complications.

Limitations

The sample size of the study is very low. And as the study is conducted only for a period of 6months we are unable to scrutinize the progress of the condition with the recommended life style modifications.

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REFERENCES

1. Vijaya K, Bharatwaj RS. Prevalence and undetected burden of polycystic ovarian syndrome (PCOS) among female medical undergraduate students in South India - a prospective study in Pondicherry. *Glob J Res Analysis (GJRA)*. 2014 Jan;3(1):63-4.
2. Gautam N, Allahbadia, Rubina Merchant. Polycystic ovary syndrome and impact on health. *Mid East Fert Soci J*. 2011;16:20.
3. Zahida Baqai, Majidah Khanam, Sajida Parvin. Prevalence of PCOS in infertile patients. *Reprod Health*. 2010 Jul-Sep;16(3):437-40.
4. Baby Center. Polycystic ovary syndrome (PCOS): what you need to know? 2014. Available at: <http://www.babycenter.in/a7432/polycystic-ovary->

- syndrome-pcos-what-you-need-to-know. Accessed 4 May 2014.
5. Women's Health. Polycystic ovarian syndrome (PCOS) fact sheet, 2014. Available at: <https://www.womenshealth.gov/publications/our-publications/fact-sheet/polycystic-ovary-syndrome.html>. Accessed 3 May 2014.
 6. Joyce King. Polycystic ovary syndrome. *J Midwif Women's Health.* 2006;51(6):416-7.
 7. Rollinoats. Polycystic ovarian syndrome (PCOS), 2014. Available at: <http://www.rollinoats.com/ns/DisplayMonograph.asp?StoreID=DWRVUW2L6MVU8K8RKLUEPFW532WBWA9&DocID=condition-pcos>. Accessed 15 April 2014.
 8. Ligia G, Estela ML, Aquino. Polycystic ovary syndrome in Salvador, Brazil: a prevalence study in primary healthcare. *Reprod Biol Endocrinol.* 2012;10:96.
 9. Samar M, Asma Afaneh, Hafsa Mo'alla. Epidemiology of polycystic ovary syndrome: a cross sectional study of university students at An-Najah national University-Palestine. *Reprod Biol Endocrinol.* 2013;11:47.
 10. Fahimeh R, Masoumeh Simbar, Maryam Tohidi, Farhad Hosseinpanah, Fereidoun Azizi. The prevalence of polycystic ovary syndrome in a community sample of Iranian population: Iranian PCOS prevalence study. *Reprod Biol Endocrinol.* 2011;9:39.
 11. Susan M, Kristen A. Pate. Epidemiology, diagnosis, and management of polycystic ovary syndrome. *Clin Epidemiol.* 2014;6:1-13.
 12. Howard A. Epidemiology, clinical manifestations and pathophysiology of polycystic ovary syndrome. *Adv Sci Med.* 2003 Aug;3(8A):S733-9.
 13. Saghar S, Hamidreza Esmaeilnia Shirvani, Abbas Entezari. Evaluation of the prevalence of polycystic ovarian syndrome among adolescent (15-18 years old) girls in Tehran during 2005-2006. *Int J Fertil Steril.* 2010 Oct-Dec;4(3):122-7.
 14. March WA, Moore VM, Willson KJ, Phillips DI, Norman RJ, Davies MJ. The prevalence of polycystic ovary syndrome in a community sample assessed under contrasting diagnostic criteria. *Hum Reprod.* 2010;25(2):544-51.
 15. Kristi Panchuk, M. Judith Lynam. Polycystic ovary syndrome: appreciating the complexities and implications of diagnosis for primary care. *UBC Med J.* 2012 Sep;4(1):11-3.
 16. Geetha K, Elezabeth Bijoy, Mohamed Hisham. A cross sectional study on polycystic ovarian syndrome in a south Indian population. *Indian J Hosp Pharm (IJHP).* 2013;50:140-3.

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