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To study Thyroid function in women with a new diagnosis of polycystic ovary syndrome

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Abstract

Background: Physical and emotional stress in postpubescent young women is most commonly caused by menstrual problems and infertility. The vast majority of women who suffer from menstrual irregularities do not seek medical attention until they are diagnosed as infertile. The most prevalent reasons for menstrual irregularity include polycystic ovarian syndrome and hypothyroidism.

Material and Methods: This was the observational, cross-sectional study. We chose 70 post pubertal women from G. S. L. Medical College and General Hospital, Andhra Pradesh, India of Obstetrics and Gynaecology and medical Endocrinology clinic who had complained of monthly irregularities for three months and/or infertility. Study was conducted between April, 2022 to March 2023. We continued the study based on the ultrasound findings of polycystic ovaries.

Results: Seventy-two percent of our sample cohort (mean age = 24.79) satisfied 2/3 criteria for PCOS (menstrual irregularity + USG discovery), and another 76.6% matched both criteria (clinical signs of hyperandrogenism + USG-PCO finding). Among women who fulfilled all three criteria, 26% had biochemical indications of hyperandrogenism and 60% exhibited USG-PCO (Rotterdam).

Conclusion: The results of this study suggest that screening for hypothyroidism, in addition to a reproductive hormone profile, should be addressed in PCOS/infertile women for early detection and therapy of hyperandrogenism.

Keywords: Patients, polycystic ovarian syndrome, thyroid function

INTRODUCTION

Physical and emotional anguish in post-pubescent women are most commonly associated with menstrual and reproductive issues. A 2013 World Bank poll published in a popular Indian magazine found that fertility rates in the country had been dropping consistently, on average, by 17% each year from the year 2000. Ten percent of urban Indian couples of childbearing age are sterile, according to a poll published in yet another respected magazine [1, 2].

Most women with monthly irregularities opt to overlook their condition until it has progressed to the point where they are diagnosed as infertile. The most prevalent causes of menstrual problems are polycystic ovarian syndrome and hypothyroidism. Polycystic ovarian syndrome is the most common endocrine disorder in women of childbearing age; it frequently occurs in tandem with other metabolic disorders and worsens in untreated cases [3]. Polycystic ovary syndrome (PCOS) is characterized by ovarian cysts, increased testosterone production, and abnormally high insulin levels. Research on Western populations has shown that 4-8% of young women experience PCOS. Five to ten percent are affected in India, according to studies. Women with PCOS may have everything from minor acne to severe infertility, depending on how their bodies respond to the androgens. They tend to be overweight, which raises their risk of a variety of diseases and conditions [3-5], including diabetes, dyslipidemia, metabolic syndrome, cardiovascular disease, and cancers of the cervix and endometrium.

Once again, a disorder with a high prevalence among young women of reproductive age is hypothyroidism. Hypothyroidism's symptoms might vary from general lethargy to severe infertility. Unexpectedly, it was found that young, healthy girls used as controls had a higher incidence of hypothyroidism [6]. This shows that many apparently healthy women actually have hypothyroidism despite their outward appearance. They are found during routine checkups or when issues emerge. Patients seeking therapy at gynecological clinics for menstrual disorders and infertility were studied retrospectively, and the incidence of polycystic ovaries and elevated blood TSH was discovered. The risk of infertility and menstruation problems is elevated in women with hypothyroidism and polycystic ovarian syndrome (PCOS). Women in India who suffer from polycystic ovary syndrome may face

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astronomical expenses when trying to start a family. Research examining the correlation between the two conditions has been very robust. Final diagnosis of polycystic ovary syndrome (PCOS) is hyperandrogenism, which is exacerbated by hypothyroidism. Our group screens PCOS patients for hypothyroidism to learn more about the frequency of this disorder and the need of evaluating their thyroid function. According to a study by Sridhar et al., treating hypothyroidism first in people with both diseases is effective. Based on these findings, we conducted a cross-sectional study of TSH as the sole and most reliable marker of thyroid health in women with a recent diagnosis of polycystic ovarian syndrome (PCOS) [7-9].

The goal of this study was to see if low blood TSH levels were also present in persons with Polycystic Ovarian Syndrome. Examining hormone levels and other important parameters in patients with Polycystic Ovary Syndrome who are either euthyroid or hypothyroid.

MATERIALS AND METHODS:

This was the observational, cross-sectional study. Study was conducted between April, 2022 to March 2023. We chose 70 post pubertal women from G. S. L. Medical College and General Hospital, Andhra Pradesh, India of Obstetrics and Gynaecology and medical Endocrinology clinic who had complained of monthly irregularities for three months and/or infertility. We continued the study based on the ultrasound findings of polycystic ovaries

Inclusion Criteria:

- Women aged 15 to 35 with menstrual irregularities or infertility.

Exclusion Criteria:

- Patients receiving medication for hypothyroidism, oral contraceptives, anticonvulsants, and metformin.
- Other disorders resembling PCOS were ruled out by a thorough history and physical examination.

RESULTS

The mean values for all participants' physical and biochemical measurements are shown in table 1 below.

Table 1: The average of all physical and biochemical parameters

Parameters	Mean & std- dev for all participants	Reference interval
Age	25.80	-
BMI	27.05	19.0-25.0
Waist/hip ratio	0.82	<0.84
FBS(mg/dL)	88.12	71-111 mg/dL
2 Hrs Post Glucose (mg/dL)	125.21	<141 mg/dL
Fasting Insulin (mU/L)	29.00	2.5-36.5 mU/L
HOMA-IR	5.21	<3.0
TSH(mU/L)	4.9	0.2-4.0 mU/L
Total Testosterone (ng/dL)	54.7	13-75 ng/dL

Table 1 compares the study population's mean age, BMI, W/H ratio, FBS, 2 hrs post glucose, Fasting Insulin, HOMA_IR, TSH, and Total Testosterone to the predicted reference period.

Table: 2: % P**resentation of criteria**

Sr. No.	PCOS patients as per rotterdamcriteria	Patients
1.	Patients With Menstrual Irregularities & Usg-Pco (2/3)	62
2.	Patients Having Clinical F/O Hyperandrogenism, Usg-Pco (2/3 Criteria)	52
3.	Patients With Bio-Chemical Evidence Of Hyperandrogenism, Usg-Pco (2/3 Criteria)	18
4.	Patients Having Menstrual Irregularities, Clinical & / Biochemical F/O Hyperandrogenism, Usg- Pco (All 3 Criteria)	41

Table 2 displays the current state at (ROTTERDAM CRITERIA). Women with PCOS who meet all of the criteria are enrolled in our study.

ISSN: 0975-3583,0976-2833 VOL14, ISSUE7, 2023

Table 3: All participants' percentage distribution of presenting complaints

Sr. No.	Presenting complaints	No. of Patients
1.	Oligomenorrhoea /amenorrhoea	65
2.	Acne / hirsutism	52
3.	Weight gain	40
4.	Infertility	39

Table 3 depicts the percentage distribution of various major and minor complaints. Women had oligo/amenorrhoea in 88% of cases.

Table 4: Age distribution in PCOS

AGE	Patients	%
<19 yrs. (Adolescence)	06	08.57%
≥20	64	81.42%

Table 4 depicts the age distribution of 70 PCOS women. There were six adolescent females (19) and 64 ladies over the age of twenty.

Table 5: Body Mass Index (BMI)

BODY Mass Index(BMI)	Patients	%
Under Weight <18.4	5	7.14%
Normal 18.5-24.9	18	25.71%
Overweight 25-29.9	24	34.28%
Obese ≥30	23	32.85%

Table 5 depicts the distribution of BMI in the study population. Women were underweight in 7.14% (five), normal in 25.17% (18), and overweight in 34.28% (24) and obese in 32.85% (23) of cases.

Table 6: Distribution of waist hip ratio

W/H ratio	Patients	%
<0.7	20	28.57%
>0.7	50	71.42%

The Waist to Hip ratio distribution is seen in Table 6. Thirty percent of them had a W/H ratio below 0.7, while the remaining 68% had a W/H ratio above 0.7.

Eighty-eight percent of the 70 PCOS patients in our study met 2/3 criteria (menstrual irregularity + USG discovery), and 76.6% exhibited clinical signs of hyperandrogenism and a USG -PCO result. The mean age of our study sample was 24.79 years. Twenty-six percent and sixty percent of women, respectively, meeting all three criteria also showed biochemical signs of hyperandrogenism and USG-PCO (Rotterdam).

DISCUSSION

The rising rates of infertility and related morbidity underline the urgency of identifying the root cause and providing effective treatment. Menstrual dysfunction is the leading cause of infertility in women, even more so than structural or hereditary issues. Major factors to this form of monthly irregularity include both local (ovarian) causes such polycystic ovary syndrome and systemic causes including hypothyroidism, hyperprolactinemia, and hyperinsulinemia. The aforementioned circumstances put people at risk for anovulation [10, 12]. They often go hand in hand with one other. The most common endocrine abnormalities in young women of childbearing age are polycystic ovary syndrome (PCOS) and hypothyroidism. After a few months of treatment for PCOS, it is common to see menstruation and ovulation restored in some patients while continuing to be wrong in others in the gynecology outpatient department. Undiagnosed and untreated hypothyroidism was observed in patients who did not respond to treatment for infertility or menstrual abnormalities. The majority of these persons had subclinical hypothyroidism, although a few had overt hypothyroidism. Through screening studies, we can learn more about the epidemiology of hypothyroidism and its prevalence. Unfortunately, there is a dearth of research comparing the thyroid health of PCOS women across the entirety of India. This prompted us to investigate the state of the thyroid in newly diagnosed PCOS women [13-16].

Cross-sectional analysis of 70 women with PCOS who visited a gynecological and endocrinology clinic for help with menstrual dysfunction or infertility. The 2003 revisions to the Rotterdam criteria were used to make the diagnosis. Using a serum TSH level of 5 uU/L as the diagnostic cut-off value, we found that 22 percent of 70

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women with PCOS who were newly diagnosed also had hypothyroidism. Maryam et al. found an elevated incidence of auto immune thyroiditis and goiter in their case control study of women with polycystic ovary syndrome. Sridhar et al. found that 1.04 percent of their hypothyroid patients also had polycystic ovary syndrome. In our research, 22% of patients had hypothyroidism. These findings corroborate previous research linking thyroid dysfunction and PCOS, including that of Maryam et al. and Sridhar et al. The prevalence of hypothyroidism in PCOS women was also estimated to be 20.6% by Onno E. Janssen et al. [17-22].

Both the age distribution table and the trend of TSH in PCOS show that serum TSH levels are highest between the ages of 20 and 30. It's possible that the increased demand for thyroxin across the board as we age is responsible for this trend. If the body's normal requirement for thyroxin is not properly supplied, subfertility and even eventual infertility may follow [23-25].

Parameter means in the study population are compared to the confidence interval in Table 1. High levels of testosterone and thyroid stimulating hormone were also observed in PCOS patients. Excessive body fat, elevated insulin, impaired thyroid function, and elevated androgen levels have all been linked to polycystic ovarian syndrome [26–28].

The median ovarian volume was significantly different between the two groups. Group 1 had an average volume of, while Group 2's average volume was, or. Patients with polycystic ovary syndrome with hypothyroidism had bigger ovaries than those with PCOS and normal thyroid function. Ovarian volume increases and ovarian function decreases due to the deposition of collagen/cellular matrix that happens all throughout the body in hypothyroidism. Ovarian enlargement is most likely caused in part by the proliferation of cysts brought on by thyroid dysfunction. Screening for hypothyroidism in women with a new PCOS diagnosis [28-30] is important since, according to 2012 recommendations from the American Thyroid Association, serum TSH alone can be used to rule out thyroid illnesses.

CONCLUSION

Polycystic ovarian syndrome is a challenging disorder with a limited medical understanding that calls for cautious care. There is a strong correlation between ethnicity and this illness, therefore understanding how it appears in different people is crucial. Polycystic ovarian syndrome (PCOS) has a cyclical pathophysiology that moves from the hypothalamus to the ovary and back again. Since hypothyroidism is obviously a major contributing factor for hyperandrogenism, this study indicates that screening for hypothyroidism, along with reproductive hormone profile, should be examined in PCOS/infertile women for early diagnosis and management.

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Conflict of Interest
None

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ISSN: 0975-3583,0976-2833 VOL14, ISSUE7, 2023

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