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Research Article

**FREQUENCY OF THYROID DYSFUNCTION IN CASES OF
POLYCYSTIC OVARIAN SYNDROME****¹Dr. Nergis Taj, ² Dr Sadia Zahoor, ³ Dr. Saima Zulfiqar**

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Article Received: June 2019**Accepted:** July 2019**Published:** August 2019**Abstract:**

Objective: To determine the frequency of thyroid dysfunction in cases of PCOS presenting at Civil Hospital, Bahawalpur.

Material and methods: This cross-sectional study was conducted at Department of Obstetrics & Gynecology, Civil Hospital, Bahawalpur from July 2018 to December 2018 over the period of 6 months. Total 100 patients with PCOS were selected and thyroid dysfunction assessed in selected patients.

Results: The mean age of the study patients was 26±4.2 years. Among the study patients, 11% of them had goitre. 18% of the patients with presented with subclinical hypothyroidism. The mean TSH levels in the study patients was 4.62±2.12 mIU/ml. The overall prevalence of thyroid dysfunction was 33% in the study patients with PCOS.

Conclusions: This study concludes that the prevalence of hypothyroidism is increased in women with PCOS patients.

Key Words: Goitre, PCOS, thyroid, autoimmune

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INTRODUCTION:

Poly-Cystic Ovarian Syndrome (PCOS) is the most common endocrine disorder affecting 5-10% of reproductive age women.¹ It causes menstrual disturbance, infertility and hyperandrogenism in women. It is associated with increased metabolic and cardio vascular risk factor due to increased insulin resistance.² Thyroid dysfunction can lead to ovulatory dysfunction and subsequently, menstrual irregularity and infertility. So, both of these endocrine conditions have profound effect on reproductive function in women.³ As the prevalence of these endocrine dysfunctions increases, the association of polycystic ovarian syndrome (PCOS) and autoimmune thyroid disease is increasingly being recognised. While the causality of this association is still uncertain, the two conditions share a bidirectional relationship. Many studies are done on PCOS on its cause, clinical presentation and patho-physiology.⁴⁻⁷ However very few authors have studied the relationship between PCOS and thyroid dysfunction. The aim of this study is to study the prevalence of thyroid dysfunction in patients with polycystic ovarian syndrome and to evaluate the relationship between polycystic ovarian syndrome and thyroid dysfunction.

MATERIAL AND METHODS:

This cross-sectional study was conducted at Department of Obstetrics & Gynecology, Civil Hospital, Bahawalpur from July 2018 to December 2018 over the period of 6 months. Total 100 patients with PCOS having age 15-45 years were selected. Patients with Hyperprolactinemia, congenital adrenal hyperplasia, virilising tumour were excluded from the study.

PCOS Patients was diagnosed as a case of PCOS if three out of four things are present

1. Amenorrhea women with mean cycle of > 180 days
2. Oligomenorrhea women with mean cycle length > 35 days.
3. Clinical signs of Hyper androgenism e.g Hirsutism androgenism alopecia or acne
4. PCO on USG more than 8-10 follicles of 2-8mm in size.

Table 1: Demographic characteristics of the study patients.

Parameter	Value/ Percentage (n=100)
Mean age	26±4.2 years
Mean BMI	29±4.4 kg/m ²
Obesity	32%
Nulliparous	22%
Primi/ Multiparous	78%

A detailed history along with general physical examination which includes height, weight, body mass index, thyroid, and breast was done in every patient. Also, signs of hyperandrogenism like acne, hirsutism were also noted. A pelvic examination was performed in all indicated patients. Thyroid function was evaluated by measurement of serum thyroid stimulating hormone (TSH), free thyroxine levels (free T3 and free T4) in the fasting state. Findings were noted on pre-designed proforma.

All the collected data was entered in SPSS version 18 and analyzed. Mean and SD was calculated for numerical data and frequencies were calculated for categorical data.

RESULTS:

100 patients satisfying the Rotterdam's criteria for PCOS were enrolled for the study. The demographic characteristics of the study patients are illustrated in Table 1. The mean age of the study patients was 26±4.2 years (Range 16-43 years). 32 patients were found to be obese based on their Body Mass Index (BMI), cut off as 30 kg/m². The mean BMI of the study patients was 29±4.4 kg/m². Out of the 100 patients, 22 were nulliparous and 78 were primi or multiparous. Regarding their clinical presentation as depicted in Table 2, 92 patients presented with menstrual abnormalities, out of which 50 patients (54.7%) had oligomenorrhea, 20 patients (21.7%) had amenorrhea and 22 patients (24%) had metrorrhagia. 52% of the patients presented with signs of clinical hyperandrogenism. Ultrasound showed polycystic ovaries in 96 patients.

The prevalence of various thyroid dysfunction in patients with PCOS is illustrated in Table 3. Among the study patients, 11% of them had goitre. 18% of the patients with PCOS presented with subclinical hypothyroidism (TSH >5 mIU/ml). The mean free T3 in patients with PCOS was 3.12±1.26 pg/ml, the mean free T4 being 1.28±2.42 ng/dl. The mean TSH levels in the study patients was 4.62±2.12 mIU/ml. The overall prevalence of thyroid dysfunction was 33% in the study patients with PCOS.

Table 2: Clinical presentation of study patients.

Clinical parameter	Percentage (n=100)
Menstrual abnormality	92% (n=92)
Oligomenorrhea	50 patients (54.3%)
Amenorrhea	20 patients (21.7%)
Metrorrhagia	22 patients (24%)
Hyperandrogenism	52%
Ultrasound- PCOD	96%

Table 3: Thyroid dysfunction in study patients- clinical and biochemical.

Thyroid function parameters	Value / Percentage (n=100)
Goitre	11%
Subclinical hypothyroidism (TSH >5 mIU/ml)	18%
Free T3 (pg/ml)	3.12±1.26
Free T4 (ng/ml)	1.28±2.42
TSH (mIU/ml)	4.62±2.12
Thyroid dysfunction	33%

DISCUSSION:

The objective of present study was to assess the thyroid dysfunction in patients of PCOS. Mean age of the study patients was 26 ± 4.2 years which is the common reproductive age group, with high incidence of PCOS. The mean BMI of the study patients was 29 ± 4.4 kg/m² showing a tendency towards overweight and obesity. This is the common predisposing factor in both of these endocrinological conditions. Also 32% of the study patients fall under obese category. Rahul Mittal studied the prevalence of PCOD and thyroid dysfunction in obese women and concluded that there is increase in prevalence of PCOD and hypothyroid cases among the obese person.⁵ All the three Rotterdam's criteria were present in 84% of the study patients which is similar to study by Sinha et al and Ganie et al.^{1,6}

Ultrasound of the pelvis showed polycystic appearance of the ovaries in 94 patients in our study. In study conducted by Najem, et al 74% had USG features of polycystic ovaries while Anwary et al found that 100% patients had polycystic ovaries. Clinical features of hyperandrogenism like acne, hirsutism was present in 52 patients which is similar to other studies.⁷

Regarding the morphologically enlarged thyroid, 11 patients with PCOS had goitre. In a study by Sinha et al, there was high prevalence of goitre among PCOS patients (27.5% vs 7.5% of control, $P < 0.001$).¹ In present study, subclinical hypothyroidism was present in 18% of the patients and 33 patients had some form of thyroid dysfunction. In a comparative study done by Sinha et al involving 80 patients with PCOS and 80 patients as control, thyroid dysfunction was noted in 27.5% patients of PCOS as compared 11.25 controls. Subclinical hypothyroidism was found in 22.5% cases and in 8.75% controls, 2.5 cases had clinically overt hypothyroidism and autoimmune thyroiditis was found in 22.5% cases and 1.25% controls as evidenced by raised anti-TPO antibody levels (means

28.037 ± 9.138 and 25.72 ± 8.27 respectively; $P = 0.035$). PCOS patients had significantly ($P < 0.05$) higher mean TSH level (4.547 ± 2.66) as compared to control group.¹

In one study by Pinto et al, out of 168 women with PCOS, subclinical hypothyroidism was found in 19 women. Serum low-density lipoprotein cholesterol (122.6 ± 25.6 mg/dL) and PRL levels (17.7 ± 7.7 ng/mL) were significantly higher in the women with SCH compared with those with normal thyroid function.⁸ Janssen, et al observed a prevalence of thyroid disorder in 26.9% patients and Ozdemir et al found thyroid disorder in 30.5% patients.⁹⁻¹⁰ Ganie et al evaluate PCOS among 175 girls with euthyroid CLT and 46 age-matched girls with non-CLT. These girls were all 13-18 years old (mean age 14.7 years). PCOS was significantly higher (46.8%) as compared to controls (4.3%).¹³ Kachuei, et al also reported significantly higher rate (62.3%) of thyroid dysfunction in PCOS patients as compared to controls (35.7%).¹¹

Dittriche et al studied the association of thyroid-stimulating hormone with insulin resistance and androgen parameters in 103 women with PCOS. Women with thyroid-stimulating hormone ≥ 2.5 mIU/l had a significantly higher body mass index ($P=0.003$), higher fasting insulin concentrations ($P=0.02$) and altered insulin resistance indices ($P=0.007$), higher total testosterone ($P=0.009$) and free androgen indices ($P=0.001$) and decreased sex hormone-binding globulin concentrations ($P=0.01$) in comparison with women with thyroid-stimulating hormone < 2.5 mIU/l. They concluded that Women with polycystic ovary syndrome and with thyroid-stimulating hormone ≥ 2.5 mIU/l had significantly altered endocrine and metabolic changes.¹²

Comparative analysis done by Ghosh on the pathophysiological connection between these two-syndrome suggested that hypothyroidism led to lowering of sex hormone binding globulin level and increment of testosterone level but not invariably directed towards estradiol overproduction thereby resulting in polycystic ovaries.¹³

Wakim et al in their research on human reproductive biology also re-established the hypothesis that hypothyroidism worsens PCOS by further decreasing sex hormone binding globulin levels, increasing the conversion of androstenedione to testosterone and aromatization to estradiol and reducing the metabolic clearance rates of androstenedione and estrone.¹⁴

CONCLUSION:

This study concludes that the prevalence of hypothyroidism is increased in women with PCOS patients. However, long term randomised studies involving a larger sample size is needed to prove the significance of thyroid dysfunction in patients with PCOS, especially on fertility.

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