

To Investigate the Relationship of Thyroid Stimulating Hormone (TSH) In Patients with PCOS

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ABSTRACT

Background: The polycystic ovary syndrome (PCOS) is recognized as one of the most common endocrine abnormalities of women. The present study was conducted to investigate the relationship of thyroid stimulating hormone (TSH) in patients with PCOS.

Materials and Methods: This study was performed on 80 diagnosed patients with PCOS and 80 normo-ovulatory and normoandrogenic women as a control group for thyroid hormones levels. After an overnight fast of 12 hours, venous blood was collected from the antecubital vein for the assessment of Thyroid stimulating hormone as biochemical parameters. Blood samples were obtained in the follicular phase of the menstrual cycle. Descriptive statistics are expressed as mean \pm standard deviation.

Results: This study was performed on 80 diagnosed patients with PCOS and 80 normo-ovulatory and normoandrogenic women as a control group for thyroid hormones levels. The mean of TSH in the control group was found to be 1.90 mIU/L, while in patients with PCOS the mean value of TSH was found to be 5.67 mIU/L. The values of thyroid stimulating hormone was found to be increased in case groups.

Conclusion: The present study concluded that the values of thyroid stimulating hormone were found to be increased in PCOS group.

Keywords: Thyroid Stimulating Hormone, PCOS, Menstrual Cycle.


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INTRODUCTION

Polycystic ovary syndrome (PCOS) is the most common endocrine disorder with systemic metabolic manifestations and neuroendocrine-immunity disturbance in women of reproductive age. It is characterized by hyperandrogenism (HA)/hirsutism, oligo- or amenorrhea, and polycystic ovaries (PCO). PCOS is also a heterogeneous disorder that affects many body functions, resulting in several health complications, including infertility, menstrual dysfunction, hirsutism, acne, obesity, metabolic syndrome as well as autoimmune disease.¹ PCOS is characterized by hyperandrogenism and polycystic ovaries. The worldwide prevalence of polycystic ovaries amongst women is 25%. They are identified as the existence of 12 or further follicles in every ovary measuring 2-9 mm and/or enlarged ovarian volume larger than 10 mL.^{2,3} The hyper androgenic condition is thought to be a cause of deficient follicular development. PCOS is a condition of insulin confrontation, measured to be the chief aspect causal to expansion of the syndrome; analysis is based on the

existence of two out of three of the following: clinical and/or biochemical androgen excess, anovulation and polycystic ovaries on pelvic ultrasound.² Although the etiopathogenesis of hypothyroidism and PCOS is completely different, these two entities have many features in common. An increase in ovarian volume and cystic changes in ovaries have been reported in primary hypothyroidism. In the other direction, it is increasingly realized that thyroid disorders are more common in women with PCOS as compared to the normal population.⁴⁻⁷ The present study was conducted to investigate the relationship of thyroid stimulating hormone (TSH) in patients with PCOS.

MATERIALS AND METHODS

The current cross-sectional study was performed on 80 diagnosed patients with PCOS who were selected randomly from patients attending gynaecology OPD, Department of Obstetrics and Gynaecology, Rajshree Medical Research Institute, Bareilly, UP

(India) for menstrual problems. 80 normo-ovulatory and normoandrogenic women with alike age and BMI were registered as a control group for thyroid hormones levels. These Patients had usual menstrual cycles of 27–31 days and did not show clinical and/or biochemical proof of hyperandrogenism. Before the commencement of the study ethical approval was taken from the Ethical Committee of the institute and informed consent was taken from the participants after explaining the study. All the females who were in between the age of 18 to 35 years and all individuals who met the Rotterdam criteria for the analysis of PCOS were incorporated in the study.

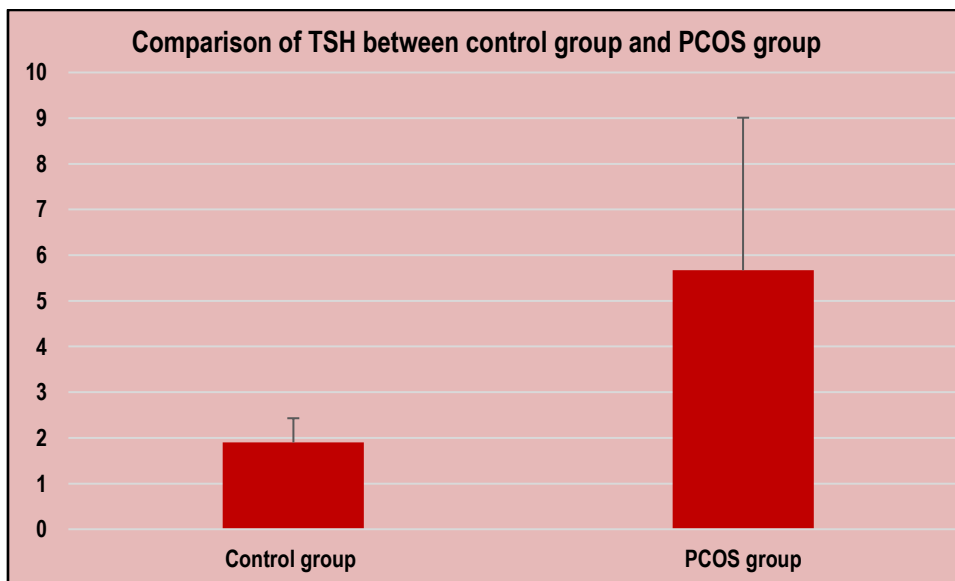
The patients on oral contraceptives or hormone replacement therapy, liver and kidney diseases, congenital adrenal hyperplasia simple virilizing or severe, adrenal insufficiency, Cushing’s

syndrome, primary amenorrhea owing to a few causes, Sheehan syndrome, pregnancy, lactation, management for infertility, premature ovarian failure, and hyperprolactinemia were excluded from the study.

A thorough clinical examination and history was taken. Menstrual history noted. Diagnosis of PCOS was done by Rotterdam classification. Another applicable history about hyper/hypothyroidism was asked. History of primary or secondary sterility was asked. After an overnight fast of 12 hours, venous blood was collected from the antecubital vein for the assessment of Thyroid stimulating hormone as biochemical parameter. Blood samples were obtained in the follicular phase of the menstrual cycle. Descriptive statistics are expressed as mean ± standard deviation.

Table 1: Comparison of TSH between control group and PCOS group

Test	Control group	PCOS group
TSH	1.90 ± 0.53	5.67 ± 3.34



Graph 1: Comparison of TSH between control group and PCOS group

RESULTS

This study was performed on 80 diagnosed patients with PCOS and 80 normo-ovulatory and normoandrogenic women as a control group for thyroid hormones levels. The mean of Thyroid stimulating hormone in the control group was found to be 1.90 mIU/L, while in patients with PCOS the mean value of TSH was found to be 5.67 mIU/L. The values of thyroid stimulating hormone were found to be increased in case groups.

DISCUSSION

PCOS women show a high prevalence of metabolic disturbances including insulin resistance, dyslipidemia, chronic low-grade inflammation and HA.⁸ The characteristics of HA in women with PCOS include elevated total and free testosterone levels and low sex hormone-binding globulin (SHBG) levels.⁹ Moreover, women with PCOS have significantly increased risk of pregnancy-related complications including gestational diabetes, hypertensive disorders, premature delivery and delivery by cesarean section.¹⁰ This study was performed on 80 diagnosed patients with PCOS and 80 normo-ovulatory and normoandrogenic women as a

control group for thyroid hormones levels. The mean of Thyroid stimulating hormone in the control group was found to be 1.90 mIU/L, while in patients with PCOS the mean value of TSH was found to be 5.67 mIU/L. The values of thyroid stimulating hormone were found to be increased in case groups.

Sinha *et al.* compared 80 PCOS females with 80 controls and found significant higher prevalence of goiter (27.5% vs. 7.5%) and subclinical hypothyroidism (22.5% vs. 8.75%) in PCOS patients as compared to controls.¹¹ Another study conducted in young women with PCOS found prevalence of subclinical hypothyroidism (defined as TSH > 4.5 µIU/ml) to be 11.3% (mean TSH level of 6.1 ± 1.2 mIU/L). There was no difference in two groups (with or without subclinical hypothyroidism) with respect to BMI, waist circumference or Ferriman–Gallwey score. Low-density lipoprotein cholesterol (LDL-C) was found to be significantly higher in the cohort with subclinical hypothyroidism.¹²

Dittrich *et al.* reported in a 103 PCOS cohort that women with TSH ≥ 2.5 mIU/L had a significantly higher BMI, fasting insulin, HOMA-IR, TC, FAI levels, and decreased SHBG level in comparison with those with TSH < 2.5 mIU/L.¹³⁻¹⁵

CONCLUSION

The present study concluded that the values of thyroid stimulating hormone were found to be increased in PCOS group.

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