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Original Research Article

Thyroid Disorders and Polycystic Ovary Syndrome

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Conflict of interest: Nil

Abstract:

Background: As the prevalence of these endocrine dysfunctions increases, the association of polycystic ovary 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. 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.

Methods: This is a cross-sectional observational study done on 100 patients with Poly Cystic Ovarian Syndrome based on Rotterdam's criteria. The exclusion criteria were hyperprolactinemia, congenital adrenal hyperplasia and virilising tumour. Thyroid function was evaluated by measurement of fasting serum thyroid stimulating hormone (TSH), free thyroxine levels (free T3 and free T4).

Results: T4 level was significantly lower in PCOS group with mean free T4 level 0.84 ± 0.74 ng/ml in PCOS group v/s 1.93 ± 0.82 ng/ml in control group (p-value = 0.001). mean serum TSH level was found to be significantly higher in PCOS group (8.81 ± 7.51 IU/ml) and in control group (3.42 ± 1.23 IU/ml) and p-value = 0.001.

Conclusion: High prevalence of thyroid disorders in PCOS patients thus points towards the importance of early correction of hypothyroidism in the management of infertility associated with PCOS.

Keywords: T4, T3, TSH, PCOS.

Introduction

Polycystic ovarian syndrome (PCOS) is the most common form of chronic anovulation associated with androgen excess; perhaps occurring in 5-10% of reproductive women. PCOS is viewed as a heterogeneous disorder of multifactorial etiology. [1] It is also associated with increased metabolic and cardiovascular risk factors. These risks are linked to insulin resistance and compounded by the common occurrence of obesity, although insulin resistance is also present in non-obese woman with PCOS. During the reproductive years, PCOS is associated with important reproductive morbidity including infertility, irregular uterine bleeding and increased pregnancy loss. [2]

Dysfunction and anatomic abnormalities of the thyroid are among the most common diseases of the endocrine gland. Abnormalities in the supply of thyroid hormone to the peripheral tissue are associated with alteration in a number of metabolic processes. Early stages of thyroid dysfunction (before symptoms are obvious) can lead to subtle change in ovulation and endometrial receptivity, which may have profound effect on fertility. Infantile hypothyroidism if untreated, leads to sexual immaturity. Untreated juvenile hypothyroidism causes a delay in the onset of puberty followed by anovulatory cycles. In adult woman, severe hypothyroidism may be associated with diminished libido and failure of ovulation. Primary ovarian failure can also be seen in patients with Hashimoto's thyroiditis as a part of autoimmune polyglandular syndrome. Rarely, in primary hypothyroidism, secondary depression of pituitary function may lead to ovarian atrophy and amenorrhoea. [3]

Material & Methods

Place of Study: Department of Obstetrics and Gynecology, Government Medical College, Dungarpur.

Study Design: Cross-sectional study.

Case: Women with PCOS which were diagnosed by Rotterdam's Criteria were cases.

Inclusion Criteria

- Age group - 13-45 years.
- Giving written informed consent.

Exclusion Criteria

- Women on OCPs.
- Women on steroids.
- Hyperprolactinemia.
- Congenital Adrenal Hyperplasia.
- Cushing's Syndrome.
- Virilizing tumor of ovary.
- Vitiligo.
- Endometriosis.

Control: Women of the same age group visiting OPD with problems unrelated to Rotterdam's Criteria of PCOS were controls.

Inclusion Criteria

- Age group - 13-45 years.
- Giving written informed consent

Exclusion Criteria

- Menstrual irregularity.
- Hyperandrogenism.
- With polycystic ovaries.
- Insulin resistance.
- Inflammatory and autoimmune disease.
- Metabolic abnormalities.

Statistical Analysis

- Continuous variables were expressed as mean and standard deviation, nominally/categorical variable was summarized as per proportion.
- Parametric and non-parametric tests were used for continuous and nominal variable as per yield of data.
- p-value < 0.05 was taken as significant.
- Medcalc 16.4 version software was used for statistical calculation.

Results

Table 1: Prevalence of Thyroid Disorder in PCOS and Control Group

Group	With Thyroid Disease		Without Thyroid Disease	
	No.	%	No.	%
PCOS	17	34.00	33	66.00
Control	6	12.00	44	88.00

34.00% PCOS cases were present with thyroid disorder.

Table 2: Thyroid profile

Variables	Cases		Controls		p-value
	Mean	SD	Mean	SD	
T_3	2.52	1.24	2.04	1.21	0.081
T_4	0.84	0.74	1.93	0.82	0.001
TSH	8.81	7.51	3.42	1.23	0.001

TSH level were significantly higher in PCOS and T4 level were significantly lower in PCOS.

Discussion

Patients with PCOS often have defective progesterone secretion which leads to an increased estrogen to progesterone ratio. Oestrogen can increase the expression of IL-6 in T cell and inhibitory action of progesterone may leads to over stimulated immune system and makes these patients more prone to autoimmune disorder. [4]

T4 level was significantly lower in PCOS group with mean free T4 level 0.84 ± 0.74 ng/ml in PCOS group v/s 1.93 ± 0.82 ng/ml in control group (p-value = 0.001). Similar results were reported by Sinha U et al (2013). [5] In our study mean serum TSH level was found to be significantly higher in PCOS group (8.81 ± 7.51 IU/ml) and in control group (3.42 ± 1.23 IU/ml) and p-value = 0.001. Significant difference was found between two groups. Similar correlation between TSH and Anti-TPO antibody level was reported by Shanmugham D et al [6]

Conclusion

High prevalence of thyroid disorders in PCOS patients thus points towards the importance of early correction of hypothyroidism in the management of infertility associated with PCOS.

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