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Assessment of thyroid function tests in polycystic ovarian syndrome

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Abstract
Women with PCOS are at possibility for infertility and premature pregnancy damage. Numerous are overweight, find it problematic to lose weight, and suffer with fatigue, depression and anxiety. Therefore, this study was planned to estimatelevels of the LH, FSH, Prolactin and TSH.

The study is conducted in Katihar Medical College and Hospital in Pharmacology department. The approval of ethical committee had been taken along with the consent from the patients were also taken. Total 50 patients having are group of 20-50 years were enrolled in to the study and divided as case and control.

The PCOD cases of patients had seen higher levels of the LH, FSH, TSH and Prolactin levels as compared to normal study group patients.

All women with PCOS should have their thyroid function tests evaluated thoroughly. Women with PCOS are at possibility for infertility and premature pregnancy damage. Numerous are overweight, find it problematic to lose weight, and suffer with fatigue, depression and anxiety. More studies should be carried to reveal the precise relationship of hypothyroidism in the context of PCOS.

Keywords: thyroid hormones, polycystic ovarian syndrome, LH, FSH, TSH and prolactin etc.

Introduction

Patients suffering from polycystic ovarian disease (PCOD) have multiple small cysts in their ovaries (the word poly means many). These cysts occur when the regular changes of a normal menstrual cycle are disrupted. The ovary is enlarged; and produces excessive amounts of androgen and estrogenic hormones. This excess, along with the absence of ovulation, may cause infertility. Other names for PCOD are Polycystic Ovarian Syndrome (PCOS) or the Stein-Leventhal syndrome [1].

Polycystic ovary syndrome (PCOS) is a set of symptoms due to elevated androgens (male hormones) in women. Signs and symptoms of PCOS include irregular or no menstrual periods, heavy periods, excess body and facial hair, acne, pelvic pain, difficulty getting pregnant, and patches of thick, darker, velvety skin. Associated conditions include type 2 diabetes, obesity, obstructive sleep apnea, heart disease, mood disorders, and endometrial cancer [2].

PCOS is due to a combination of genetic and environmental factors. Risk factors include obesity, not enough physical exercise, and a family history of someone with the condition. Diagnosis is based on two of the following three findings: no ovulation, high androgen levels, and ovarian cysts. Cysts may be detectable by ultrasound. Other conditions that produce similar symptoms include adrenal hyperplasia, hypothyroidism, and hyperprolactinemia [3].

PCOS has no cure [4]. Treatment may involve lifestyle changes such as weight loss and exercise. Birth control pills may help with improving the regularity of periods, excess hair growth, and acne. Metformin and anti-androgens may also help. Other typical acne treatments and hair removal techniques may be used. Efforts to improve fertility include weight loss, clomiphene, or metformin. In vitro fertilization is used by some in whom other measures are not effective [5].

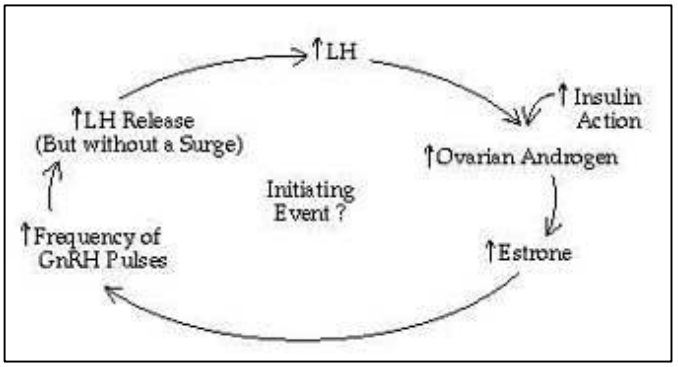

Fig 1: The self-perpetuating vicious cycle of elevated levels of androgens and estrogens in PCOD

PCOS is a heterogeneous disorder of uncertain cause [19, 24, 25]. There is some evidence that it is a genetic disease. Such evidence includes the familial clustering of cases, greater concordance in monozygotic compared with dizygotic twins and heritability of endocrine and metabolic features of PCOS [6].

The genetic component appears to be inherited in an autosomal dominant fashion with high genetic penetrance but variable expressivity in females; this means that each child has a 50% chance of inheriting the predisposing genetic variant(s) from a parent, and, if a daughter receives the variant(s), the daughter will have the disease to some extent [7]. The genetic variant(s) can be inherited from either the father or the mother, and can be passed along to both sons (who may be asymptomatic carriers or may have symptoms such as early baldness and/or excessive hair) and daughters, who will show signs of PCOS [8]. The phenotype appears to manifest itself at least partially via heightened androgen levels secreted by ovarian follicle theca cells from women with the allele. The

exact gene affected has not yet been identified. In rare instances, single-gene mutations can give rise to the phenotype of the syndrome. Current understanding of the pathogenesis of the syndrome suggests, however, that it is a complex multigenic disorder. The severity of PCOS symptoms appears to be largely determined by factors such as obesity [9].

PCOS has some aspects of a metabolic disorder, since its symptoms are partly reversible. Even though considered as a gynecological problem, PCOS consists of 28 clinical symptoms.

Women with PCOS are at possibility for infertility and premature pregnancy damage. Numerous are overweight, find it problematic to lose weight, and suffer with fatigue, depression and anxiety. Therefore, this study was planned to estimatelevels of the LH, FSH, Prolactin and TSH. There's a significant overlap of symptoms between PCOS and Thyroid Disease, despite the fact that they are two very different conditions. It is adversely affected by associated thyroid dysfunction. Both act as independent risks of ovarian failure and pregnancy related complications.

Methodology

The study is conducted in Katihar Medical College and Hospital in Pharmacology department. The approval of ethical committee had been taken along with the consent from the patients were also taken. Total 50 patients having are group of 20-50 years were enrolled in to the study and divided as case and control.

Inclusion Criteria: Excess androgen levels

Exclusion Criteria: Patients diagnosed with DM II. Hypertension, liver disorders, renal disorders and other chronic diseases.

The levels of the LH, FSH, Prolactin and TSH was assessed in both the study group patients and discussed herewith.

Results & Discussion

The data from the total 50 patients were collected and presented as below in two groups.

Table 1: Age group of the patients

Group	Group I: Case	Group II: Controls
Number of Patients	25	25
Age in years	22-38	25-42
Weight in kg	45- 73	43-75

The age of the both the groups patients are ranging from 20-50 years.

Table 2: Levels of the Markers

Group	Group I: Case	Group II: Controls
LH	21.5 ± 15.8	6.3 ± 3.8
FSH	8.1 ± 4.8	5.9 ± 2.6
TSH	5.8 ± 2.1	2.4 ± 0.6
Prolactin	14.9 ± 9.5	11.3 ± 5.6

The PCOD cases of patients had seen higher levels of the LH, FSH, TSH and Prolactin levels as compared to normal study group patients.

The information collected from the present study disclosed that women with PCOS have developed TSH levels and are also additional likely to have subclinical hypothyroidism when linked to age-matched controls without PCOS. This is in agreement with study done by Janssen OE *et al* [10]. Numerous studies have recommended a lower cut off than the conservative 4-5 miU/L to define subclinical hypothyroidism. The National Academy of Clinical Biochemistry (NACB)'s laboratory guidelines state that >95% of thorough hlyseparated normal euthyroid volunteers have serum TSH values between 0.4 and 2.5 mIU/L [11]. A 2011 study associated two groups of women with hypothyroidism—one group with polycystic ovaries and the other with normal ovaries—to a group of women with normal thyroid function. The researchers revealed that the hypothyroid women had bigger ovaries. Providing thyroid hormone replacement therapy decreased the size of the ovaries in both groups of hypothyroid women, and enhanced TSH, FT3 and FT4, prolactin, estradiol, free testosterone and total testosterone levels. Dahiya *et al* [12] also found raised levels of TSH in PCOS patients. Ghosh, *et al*. [13] tried to evaluate the role of hypothyroidism in the causation of PCOS. Hypothyroidism can lower the levels of sex hormone binding globulin (SHBG) which in turn can lead to higher concentrations of free testosterone.

Conclusion

All women with PCOS should have their thyroid function tests evaluated thoroughly. Women with PCOS are at possibility for infertility and premature pregnancy damage. Numerous are overweight, find it problematic to lose weight, and suffer with fatigue, depression and anxiety. More studies should be carried to reveal the precise relationship of hypothyroidism in the context of PCOS.

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