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AURUM SAĞLIK BİLİMLERİ DERGİSİ
AURUM JOURNAL OF HEALTH SCIENCES

Cilt 5, Sayı 1 | Bahar 2023
Volume 5, No 1 | Spring 2022, 3-8

STUDY OF LABORATORY AND CLINICAL FINDINGS IN PATIENTS WITH POLYCYSTIC OVARY SYNDROME

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Received: 29.03.2023
Accepted: 12.04.2023
Clinical Research Article
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Abstract

Background/aim: To study blood parameters and clinical features of patients with polycystic ovary syndrome (PCOS).

Materials and methods: We retrospectively studied 200 patients diagnosed with PCOS admitted to the Obstetrics and Gynecology Outpatient Department of Afyon State Hospital between March 2019 and June 2021. We noted the complaints of the outpatient clinic also their body mass indexes, the presence of insulin resistance according to the Homeostatic Model Assessment (HOMA) index, and their hormone profiles.

Results: The mean age of the PCOS patients was 25.0±4.3 years, and the mean body mass index was 24.8±3.7 kg/height (m2). According to HOMA (n=31), 31% of patients have insulin resistance. Female patients frequently visited the clinic because of menstrual irregularities. Elevated prolactin levels were noted in 15% of patients. thyroid-stimulating hormone levels are elevated in 10% of the patients.

Conclusion: Polycystic ovary syndrome is a genetic problem and may have clinical symptoms with insulin resistance. Patients have gynecological symptoms and metabolic changes. Patients diagnosed with PCOS should be fully informed and educated about the risks that may occur during their lifetime. Additional to medical treatment, patients should exercise and have a proper diet.

Keywords: Insulin resistance; metabolic disease; polycystic ovarian syndrome

1. Introduction

Polycystic ovary syndrome (PCOS) was described by Stein and Leventhal in 1935. It is a syndrome with menstrual irregularities of varying degrees, hirsutism, acne, and insulin resistance. It is the most common endocrinopathy in women of reproductive age. The prevalence is approximately 6-8% (Mizgier et al., 2021). In 1980, Burghen et al.

first reported the association between PCOS and hyperinsulinism. Insulin resistance was found in 40-75% of PCOS cases. An increase in the frequency of type 2 DM and glucose intolerance of 5-30% was found in these women

(Nekooi et al., 2022). PCOS may be associated with hyperandrogenism, hyperinsulinemia, and glucose intolerance, and may cause long-term conditions such as infertility, recurrent spontaneous abortions, hyperlipidemia, type 2 DM, HT, and coronary atherosclerosis, endometrial hyperplasia, endometrial cancer. Medical or surgical treatment options are used in these patients (Kabakchieva et al., 2021).

In the study, our focus was the patients with polycystic ovary syndrome (PCOS), the relationships between biochemical and hormonal blood parameters, and insulin resistance.

2. Materials and Methods

We retrospectively studied 200 patients diagnosed with PCOS who were admitted to the Obstetrics and Gynecology Outpatient Department of Afyon State Hospital between March 2019 and June 2021. Patients were diagnosed with polycystic ovary syndrome according to the Rotterdam criteria;

Age, body mass index, admission complaints, family history, ultrasound findings, hormone profiles (follicle-stimulating hormone-FSH, luteinizing hormone- LH, total and free testosterone, prolactin, thyroid-stimulating hormone-TSH), and biochemical parameters (fasting blood glucose-FBG) were recorded. Body mass index was calculated for all cases with the formula kilogram/height (m2). A weight of 25 kg/m2 or more was taken as the cutoff point for obesity. Insulin resistance was calculated using the Homeostatic Model Assessment -HOMA index- (fasting insulin x fasting glucose)/405). Because fasting glucose was calculated in mg/dl, the constant was taken as 405 and the cutoff value was taken as 2.5. Local ethics committee approval was obtained (2021/1-2030-KAEK-2).

2.1. Statistical analyses

Data analysis was performed using the SPSS 22 program for Windows, and the Student T test analysis method was used for between-group analysis. The P value < 0.05 was considered statistically significant.

3. Results

The mean age of PCOS patients was 25.0±4.3 years, and the mean body mass index was 24.8±3.7 kg/weight (m2). Insulin resistance was detected in 31% of patients according to HOMA, which is one of the most important diagnostic criteria for PCOS patients.

The ratio LH/FSH > 2 was 54%. prolactin and thyroid-stimulating hormone levels were examined in all patients and are elevated in 15% and 10% of patients, respectively. bilateral polycystic ovary ultrasonographically is 63%, and unilateral is 28%. No sign with ultrasonographic is 9%.

patients with BMI greater than 30 kg/m2 is 23%, and 61% of the patients have BMI between 25-30 kg/m2. The BMİ was 21.9±2.1 kg/m2 in patients without insulin resistance, and it was 25.1±3.9 kg/m2 in the patients with insulin resistance.

The complaints of PCOS patients vary according to whether they were married or not. While 62% of the unmarried patients had both hair growth and menstrual irregularities, 24% had only menstrual irregularities and 14% had only increased hair growth.

Among married patients, the most common reason for referral was the desire to have a child, and only 22% of patients became pregnant spontaneously. In 41% of PCOS patients, at least one of the following conditions was present in the family history: Hypertension, diabetes mellitus, thyroid disease, and heart disease. Hypertension frequency is 30%, followed by diabetes mellitus at 23%, cardiovascular disease at 15%, and thyroid disease at 8%. 75% of patients with a family history of diabetes were patients with insulin-resistant polycystic ovary syndrome. The general characteristics of the patients are shown in Table 1.

Table 1. General Characteristics of Patients.

n:200	%
Average age (years)	25,0±4,3
Average body mass index (kg/m2)	24,8±3,7
Complaints	
Menstrual irregularity	24
Hirsutism	14
Menstrual irregularity and Hirsutism	62
İnfertility	27
PCO by ultrasonographically	63
LH/FSH >2	54
Prolactin elevation	15
Thyroid Stimulating Hormone elevation	10
İnsulin resistance	31

3.1.1. Symbols, units, and abbreviations

The journal, on the whole, adheres to the guidelines outlined in Scientific Style and Format, which can be found in The CSE Manual for Authors, Editors, and Publishers, published by the Council of Science Editors in Reston, Virginia, United States (7th ed.). If you need to include special characters in your document, such as, or v, you can do so through the Symbol menu in Microsoft Word. The superscripted letter o or the number 0 may not be substituted for the degree symbol (°), which must be selected from the Symbol menu. It is imperative that the symbol for multiplication, be utilised rather than the letter x. There should be a space between the number and the unit (for example, 3 kg), as well as between the number and the mathematical symbols (+, –, =, >), but there should not be a space between the number and the percent symbol (for example, 45.5%). Kindly use the SI unit system. It is

important to provide a full explanation the first time an abbreviation or acronym is used. Italicization is not required for Latin phrases such as "et al.," "in vitro," or "in situ."

4. Discussion

Although the exact pathophysiology of PCOS is unknown, several hypotheses have been proposed. High rates of obesity, hyperinsulinemia, impaired glucose tolerance, hyperandrogenemia, dyslipidemia, increase in plasminogen activator inhibitor, and blood pressure in patients with PCOS.

The fact that it can be followed indicates that it is an endocrinologic as well as a metabolic disorder. glucose tolerance is normal in 14% of women with PCOS in the study (Falcetta et al., 2021).

diet and exercise are the first recommendations made by physicians. One study examined 235 patients diagnosed with polycystic ovary syndrome and found that the most common reason for admission was oligomenorrhea. patients with LH /FSH > 2 are 15%, also 46% of patients have insulin resistance based on the HOMA index (Robinson, 1993). In our study, the main complaint for doctor visits was a menstrual irregularity and oligomenorrhea. LH /FSH > 2 in 54% of patients; there was insulin resistance in 33% of patients. In our study, high levels of free testosterone were found in 38% of patients, whereas in the other study this proportion was only 14%. Metabolic syndrome (MS) and polycystic ovary syndrome are distinctly different; however, they are related. (Karavani et al., 2021).

Metabolic syndrome affects reproductive characteristics. Clinical studies and the data obtained have shown that there is a pathophysiological relationship between PCOS and MS (Kayacık Günday et al., 2022).

PCOS treatment has two different approaches pharmacological (oral contraceptives, antiandrogens, gonadotropin-releasing hormone agonists, steroids, and insulin sensitizers) and nonpharmacological (diet, exercise, weight loss) (Naumova vd, 2020). Even if patients receive pharmacologic treatment, nonpharmacologic treatment should be recommended. Studies show exercising regularly has good effects on the cardiovascular system and immune systems. In addition, exercise protects against diabetes by increasing insulin sensitivity. Exercise also has many beneficial effects on other organ systems (Karimi et al., 2018).

Some studies highlight the importance of non-pharmacological investigations on PCOS. Giallauria et al divided 120 PCOS patients into two groups (Giallauria et al., 2008).

They applied a three-month regular exercise program to one group and noted an improvement in autonomic function and inflammatory patterns in the exercise group at the end of the three months.

Otta et al reported that metformin has an additive effect to exercise and diet in improving hyperandrogenism and insulin resistance (Fux Otta et al., 2011). In their study, 40 patients with polycystic ovary syndrome were divided into two groups that received lifestyle modification and metformin or placebo for 4 months. At the end of the study, it was found that metformin was very beneficial when combined with diet and exercise. In our study, we investigated the associations between insulin resistance and body mass index and patients diagnosed with polycystic ovary syndrome.

The average age of the patients in our study was young. As it corresponded to the population, the criteria for metabolic syndrome did not seem to be fully established. Therefore, biochemical and hormonal parameters were more regulated compared with other studies. In conclusion, patients with polycystic ovary syndrome need multidisciplinary investigation between gynecologists and endocrinologists. Patients should be informed of the risks they face in the future and counseled accordingly. In addition to pharmacological treatment, non-pharmacological treatments should be recommended.

Funding Source

This research did not receive any funding.

Conflict of Interest

The authors declare no competing interest.

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