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Research Article

**STUDY TO KNOW THE INCIDENCE OF INSULIN
RESISTANCE IN POLYCYSTIC OVARIAN SYNDROME
PATIENTS**¹Dr.Risham Fatima Pirzada , ²Dr.Nadeem Khan, ³Dr.Ayisha Afzal¹University College Of Medicine and Dentistry, Lahore²Multan Medical and Dental College³University College of Medicine and Dentistry, lahore**Abstract:**

Objective: To determine the incidence of insulin resistance (IR) in polycystic ovarian syndrome patients with simple insulin resistance indices and to know the relation of PCOS clinical manifestations with insulin resistance indices.

Study Design: A cross-sectional study.

Place and Duration: In the Endocrinology Department of Services hospital, From December 2016 to December 2017 for duration of one year.

Methodology: A hundred patients who met the Rotterdam 2003 diagnostic criteria for polycystic ovarian syndrome were selected for the study. Descriptive statistics was recorded with standard deviation and frequency. Using fasting insulin levels (> 10 IU / ml) Insulin resistance (IR) was calculated, fasting glucose / insulin ratio (> 4.6). The different indirect IR signals were calculated as McAuley (< 5.8), QUICKI (< 0.357) and HOMA-IR (> 2.7).

Findings: HOMA-IR, QUICKI and McAuley values were 65%, 88% and 51.2% in patients with PCOS, respectively. Patients with Blood sugar fasting levels (> 10 uu / ml) were 76.02%. With hirsutism, infertility and obesity the most common presentation was Menstrual irregularities. There was a strong relation between various irregularities, insulin resistance and hyperinsulinemia .

Conclusion: High-frequency insulin resistance and hyperinsulinemia were seen in patients with polycystic ovarian-syndrome. With insulin resistance indices great numbers of clinical manifestations are related.

Keywords: Polycystic ovarian syndrome, Insulin resistance, homeostatic, model evaluation.

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INTRODUCTION:

In the endocrine the most common problem is Polycystic ovarian syndrome (PCOS) which affects women in reproductive age with frequency of 6-11%. It is diagnosed a clinically characterized by the the following features and at least two features are necessary for confirmation; anovulation or Chronic Oligo-ovulation, polycystic ovaries and androgens on ultrasonography. Common clinical manifestations include a number of menstrual irregularities, infertility, obesity and hirsutism, and hyperandrogenism such as acne and alopecia. Despite the PCOS studies, the risk of developing hypertension, dyslipidemia in patients and associated with various metabolic abnormalities is increased, and the pathophysiology of glucose tolerance or PCOS and type 2 diabetes is not fully understood. The complex interactions between ovaries, insulin and gonadotropins action are responsible for PCOS and its various manifestations. The increase in affirmation supports the insulin resistance central role or the increase in insulin action in the pathogenesis of the syndrome. To evaluate insulin resistance and insulin sensitivity Various methods are used. This hyperinsulinemic clamp technique euglycemic glucose is the least modal analysis assay tested for glucose tolerance IV (TIVGTT) 11 and is frequently obtained from glucose values derived from various indices or an oral glucose tolerance and fasting insulin. The glucose clamp method is considered to be the most appropriate test to measure the effect of insulin presently available, but at the same time it is very complex technique and is not easy to administer. Proximal approach uses insulin in fasting stage and glucose calculations that give doctors less invasive and fastest method to obtain patient data. On PCOS ha Most of the studies have been done on people of European origin, so very little data on IR ratio in women in Southeast Asia is available. In PCOS patients to determine the frequency of insulin resistance this study was performed using insulin

resistance simple indices and to know the relation of PCO with insulin resistance and clinical manifestations.

MATERIALS AND METHODS:

This cross-sectional study was held in the Endocrinology Department of Services hospital, From December 2016 to December 2017 for duration of one year. All patients who were referred to the outpatient clinic were included in the detailed story in a pre configured form study. Included in the Rotterdam consensus workshop in 2003, Complete physical examinations, including weight, height, blood pressure and waist circumference measurements were performed on every patient. According to the Ferriman and Gallwey scores Hirsutism was evaluated. Biochemical hormone assessment was performed with lipid profile and insulin levels, TSH, OGTT, DHEA-S, progesterone, estradiol, prolactin 17 OH, fasting plasma glucose fasting serum testosterone, FSH, LH, (total). Ultrasound of the ovaries was performed on each patient. fasting insulin ratio, insulin resistance, sensitivity of qualitative control rate and homeostatic model evaluation (HOMA-IR), glucose fasting plasma insulin (QUICKI) and McAuley. $HOMA-IR = \frac{\text{glucose (mmol / l)} \times \text{Insulin (IU / ml)}}{23.05}$ Cut > 2611 $QUICKI = \frac{1}{\log(\text{fasting glucose}) + [\log(\text{fasting insulin})]}$ cutoff value <0.35712 Index McAuley = $\text{Exp} [2.63 - 0.28 \ln(\text{insulin mU / L}) - 0.31 \ln(\text{fasting plasma glucose (mg / dl)} / \text{triglyceride mmol / insulin (IU / ml)})]$ cut - off value <04.51 fasting.

RESULTS:

In this study reproductive age women were selected. 27.01 ± 8.04 was the mean age. Table I describes the distribution percentage of abnormal and normal clinical, ultrasonographic and biochemical characteristics of patients.

Table-I: Percentage distribution of different characteristics.

Age (yrs)	26.58 ± 7.84
15-20	25 (25%)
21-25	23 (23%)
26-30	27 (27%)
>30	25 (25%)
BMI (kg/m ²)	31.92 ± 7.39
Underweight <18	2 (2.0%)
Normal 18 - 22	12 (12.0%)
Overweight 23 - 25	6 (6.0%)
Obese > 25	80(80.0%)
Age at menarche (yrs)	12.57 ± 1.01
<i>Marital status</i>	
Married	57 (57.0%)
Un-married	43 (43.0%)
<i>Menstrual problems</i>	
Irregular cycles	83 (97.64%)
Oligomenorrhea	38 (43.68%)
Amenorrhea (secondary)	21 (25.88%)
Hirsutism	48 (51.61%)
Infertility	26 (46.42%)
Serum Testosterone (ng/dl)	31.5 ± 50.12
FSH level (mIU/ml)	9.11 ± 12.28
Normal	(93.30%)
Abnormal	(6.70%)
LH level (mIU/ml)	13.20 ± 12.83
Normal	(59.2%)
Abnormal	(40.80%)
Insulin level	19.59 ± 14.62
Normal	19 (24.68%)
Abnormal	58 (75.32%)
<i>Ultrasound of ovaries</i>	
Normal	(23.3%)
Abnormal	(76.67%)

100 patients had 51.61% hirsutism varying degrees, menstrual irregularity was observed in 86% of patients, obesity was observed in 80.6% (BMI > 25 kg / m²), 43.68% and 26.08% of patients were referred with secondary amenorrhea and oligomenorrhea respectively. In 47.2% of married women Infertility was observed. FSH and LH hormonal tests were 93.3% and 59.2%, respectively. Deteriorated GTT was found in 32% of cases, while type 2 diabetes was diagnosed in 12.9% of patients.

Table-II: Insulin Resistance in patients with PCOS.

Insulin Resistance	N	%
Fasting Insulin level (> 10)	61	75.3
HOMA-IR (> 2.6)	46	67.6
QUICKI (< 0.357)	60	88.2
McAuley (< 5.8)	21	48.8
Fasting G : I ratio (< 4.5)	21	31 %

Using different indices of insulin resistance measurement frequency of PCO measured given in Table II. McAuley and HOMA - IR, QUICKI values were 68.02%, 89.012% and 49.02% respectively. Fasting insulin levels were > 10 IU / ml in approximately 75.3% of the patients. The echographic appearance of the polycystic ovaries identified in the Rotterdam 2003 consensus study (76.7%) was seen in the patient. There was a strong association between PCO and various abnormalities, insulin resistance and hyperinsulinemia.

Table-III: Association of clinical features of PCO patients with insulin resistance indices.

	HOMA IR	QUICKI	Fasting insulin	McAuley	Glucose to insulin ratio
Menstrual irregularities	1.65(0.33-8.15)	1.28(0.13-12.3)	1.02(0.12-3.2)	1.3(0.26-6.82)	1.13(0.20-6.36)
Hirsutism	0.69(0.24-2.05)	0.86(0.17-4.22)	0.59(0.2-1.75)	0.80(0.22-2.9)	0.72(0.25-2.09)
Infertility	0.8(0.18-3.42)	1.32(0.194-9.02)	1.18(0.23-6.11)	3.0(0.35-25.86)	2.07(0.53-7.99)
Diabetes	0.66(0.55-0.79)	0.87(0.79-0.96)	0.72(0.62-0.83)	0.46(0.33-0.64)	1.5(0.23- 9.77)
Cystic Ovaries	2.93(0.71-12.1)	12.08(1.88-77.66)	9.6(2.22-41.52)	2.5(0.48-12.88)	1.68(0.37-7.63)
Obesity	3.5(0.91-13.44)	4.4(0.82-23.5)	3.57(1.01-12.58)	5.06(0.511-50.2)	2.45(0.47-12.6)

Similarly, most clinical findings are associated with insulin resistance indices (Table III).

DISCUSSION:

In this study, simple IR indices, clinical presentation, biochemical and ultrasonic characteristics and the frequency of insulin resistance were documented in patients with PCOS. The wide variation in the presentation characteristics of PCOS leads to difficulties in the analysis of PCOS patients and compares the data with other studies performed in the regional and international arena. The results of our study revealed the incidence of hyperinsulinemia (fasting insulin level > 10) and insulin resistance when compared to studies in white Caucasian PCOS patients. Studies have shown that fasting insulin levels are higher in 40% of women with PCOS, but we found that 60-80% of hyperinsulinemia and insulin resistance in our study were comparable to other studies. The results of our Locally Hyperinsulinemia can also be compared with the results of another study with a 55-60% incidence in immigrants from South Asia (Indians and Sri Lankans) residing in the UK. For this reason, ethnic and genetic effects on the insulin resistance frequency in PCOS patients can not be ruled out. In anovulatory women Insulin resistance with PCOS is much obvious than in equally hyperandrogenic women with regular menstruation. With our study these results correlates well, as with insulin resistance patients have a number of menstrual disorders, such as oligomenorrhea or secondary amenorrhea, such as obesity. A variable degree of hirsutism was observed in 47.36% of the patients, but this is not always associated with serum testosterone levels, indicating hirsutism in the nonpathologic population. Studies have shown that ethnic variations in hair growth rate must be taken into account in all patients with hirsutism. 80.0% of our study was obese with 25 or more BMI. In different studies, obesity was observed in 40-70% of patients with PCOS. WHO redefined cut-off values for obesity in women in South Asia; BMI > 25, Caucasian is considered to be BMI > 30 for women. Class I is considered to be obesity. Because it is an old condition, PCOS with PCOS is associated with insulin resistance in patients with a tolerance of wider glucosome, eg tolerance tolerance, type 2 cardiovascular complications of diabetes, dyslipidemia and metabolic complications. vascular risk factors.

CONCLUSION:

In this study it is concluded that Large-scale epidemiological studies of large-scale UR treatments will be effective, so patients affected by the insulin resistance level of patients in South Asia need to be assessed.

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