Journal Homepage: - www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI: 10.21474/IJAR01/3704
DOI URL: http://dx.doi.org/10.21474/IJAR01/3704

RESEARCH ARTICLE

CLINICAL PRESENTATION OF POLYCYSTIC OVARY SYNDROME AMONG SAUDI ARABIAN WOMEN – JEDDAH – SAUDI ARABIA.

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Manuscript Info

Manuscript History

Received: 14 January 2017
Final Accepted: 10 February 2017
Published: March 2017

Abstract

Background: Polycystic ovary is a highly variable condition with a wide array of presentations. The Polycystic ovary syndrome should meet at least two of the following three criteria: oligo- or anovulation; clinical and/or biochemical signs of hyperandrogenism; polycystic ovaries on ultrasound. The prevalence of PCO is largely unknown in Saudi Arabia.

Objectives: The aim of this study was to investigate the reproductive hormones levels in patients with PCOS in addition to the effect of age and body mass index (BMI) on the hormonal findings and ultrasound & to determine the clinical, biochemical and etiologic features of hirsutism in Saudi females.

Methodology: A cross sectional study has been conducted among total of 183 patients diagnosed with PCOS have been assessed clinically along with measuring the level of reproductive hormones in Obstetrics and Gynecology Clinic at King Abdul-Aziz hospital and oncology center in Jeddah, Saudi Arabia, between June 2015 and June 2016.

Conclusion: Elevated levels of LH/FSH and testosterone and reduced FSH, SHBG, and progesterone were predictors of PCOS. This was independent of BMI or age. Future studies with larger sample size and data on insulin levels are needed for greater understanding of the manifestation of PCOS in the Saudi population.

Introduction:-

Polycystic ovary **(PCOS/PCOD)** is the most common endocrinopathy in women of reproductive age, with a prevalence of up to 10%. It is a complex condition that was first described in women who had PCOS as the underlying cause of hirsutism and chronic anovulation [1]. PCOS is a growing epidemic among Saudi Arabian women, and women around the world although is a highly variable condition with a wide array of presentations. In study conducted on Saudi girls, the estimated prevalence of PCOS was observed to be 53.7% which is strikingly higher [2].

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With the new guidelines for diagnosis of PCOS, The European Society of Human Reproduction and Embryology/American Society for Reproductive Medicine criteria, often called Rotterdam, includes various phenotypes based on a combination of any two of the three findings of hyperandrogenism, menstrual irregularity, and polycystic ovaries on ultrasound [3]. However, polycystic ovary as a phenomenon is very common in women with idiopathic hirsutism and oligomenorrhea [4]. Also a wealth of literature agrees that women may present an appearance of PCOS at ultrasound without any sign of androgen excess, although with indicators of ovarian dysfunction [5]. Similarly, PCOS is diagnosed by exclusion, and disorders having a phenotype related to that of PCOS must be ruled out; such as congenital adrenal hyperplasia, Cushing syndrome and virilising tumors [6].

The principal findings in patients with PCOS include irregular menstruation, acne, and excessive amounts of androgenic hormones. Obesity is a common finding of women with PCOS [7-8-9]. PCOS is not merely a disease of the reproductive system, since type 2 diabetes, metabolic syndrome, and sometimes cardiovascular disease have been associated with this condition [9].

Ultrasound evaluation of patients with suspected PCOS in study has been confirmed that presence of 12 or more 2–9 mm follicles appears more sensitive than either ovarian volume or stromal brightness to diagnose PCOS [2].

In the literature, several groups have investigated the reproductive hormones of women with PCOS in comparison to healthy controls. Follicle stimulating hormone (FSH) and sex hormone-binding globulin (SHBG) were found to be lower in several studies [10-11-12-13]. In addition, mean concentration of testosterone was higher in patients with PCOS compared to controls [14]. Furthermore, it has been shown that luteinizing hormone (LH) and LH/FSH ratio were elevated in PCOS patients compared to normal controls [15-16-17]. The results, however, depended on the day of the cycle on which the hormones are measured, wherein LH was significantly elevated in PCOS patients only late in the menstrual cycle but not earlier [12].

In Study has been done in 2006 explained that PCOS has three major pathophysiologic hypotheses have been proposed to explain the clinical findings [18]: the LH hypothesis, the insulin hypothesis and the ovarian hypothesis although the fact that the pathogenesis of PCOS has not clear.

Methodology:-

This study was conducted on women who attended the Obstetrics and Gynecology Clinic at King Abdul-Aziz hospital and oncology center in Jeddah, Saudi Arabia, between June 2015 and June 2016. Women aged between 18 and 45 years were screened for the presence of PCOS.

Study subjects:-

A total of **183** Saudi patients diagnosed with PCOS based on the Revised 2003 Rotterdam Criteria during this study period were included in the study. According to the Rotterdam ESHRE/ASRM-sponsored PCOS consensus workshop group, two out of three of the following must be present to establish diagnosis: Oligo- and/or anovulation, clinical and/or biochemical signs of hyperandrogenism, and polycystic ovaries. Exclusion of other etiologies (congenital adrenal hyperplasias, androgen-secreting tumors, Cushing's syndrome) was conducted. The agreed ultrasound features of PCOS was confirmed by presence of 12 or more 2–9 mm ovarian follicles; a peripheral distribution of ovarian follicles; an ovarian volume of more than 10 cm3 and a highly echogenic ovarian stroma [2]. For the purpose of this study, all diagnoses were made by a consultant gynecologist in association with a senior ultrasonographer. All participants signed an informed consent form.

Hormonal investigations:-

Blood samples were withdrawn between days 1 and 5 of the period. LH, FSH, estradiol (E2), dehydroepiandrosterone sulfate (DHEA-SO4), SHBG, total testosterone, prolactin, and progesterone were determined by immunoassay. Serum levels of thyroid stimulating hormone (TSH) and 24-h urinary cortisol were not measured.

Other information:-

Regular menstruation was defined as 9–16 cycles of 21–35 days duration within a year, and no more than a 4-day difference in duration between cycles. The subjects were checked for the presence of acne and/or blackheads on the face, neck, upper arm, chest, and back. Using the modified Ferriman and Gallwey score [18], the subjects were checked for hirsutism. A Ferriman and Gallwey score higher than 7 indicated hirsutism.

Results:-

The main demographics of cases and controls are presented in Table 1. A total of 183 participants; 77 (42.08%) aged 38 to 45 years old, 71 (19.13%) aged 18 – 27 years old, and 35 (19.13%) aged 28 – 37 years old. In relation to body mass index (BMI) 0 (00%) were under weight, 45 (24.59%) were normal weight, 15 (8.20%) were overweight, 58 (8.20%) were class I obesity, 62 (33.88%) were Class II obesity, and 3 (1.64%) class III obesity. Regarding the clinical presentation (80.33%, 93.44 %, 68.31%, and 20.77%) of the participants were had acne, hirsutism, oligomenorrhea, and infertility respectively. In addition to that 97.81% of the participant has 12 or more follicles measuring 2–9 mm.

Table 1:- Main Demographics Of Cases.

VARIABLES		NUMBER	PERCENTAGE
AGE (YEAR)	18 - 27	71	38.80%
	28 - 37	35	19.13%
	38 - 45	77	42.08%
BMI	< 18.5	0	0.00%
	18.5 - 24.9	45	24.59%
	25 - 29.9	15	8.20%
	30 - 34.9	58	31.69%
	35 - 39.9	62	33.88%
	> 40	3	1.64%
HISTORY OF ACNE	yes	147	80.33%
	No	36	19.67%
FERRIMAN–GALLWEY SCORE	< 7	12	6.56%
	> 7	171	93.44%
HISTORY OF OLIGOMENORRHEA	yes	125	68.31%
	No	58	31.69%
HISTORY OF INFERTILITY	Yes	38	20.77%
	No	145	79.23%
Positive finding OVARIAN FOLLICLE	≥ 12 follicles or more follicles measuring 2–9 mm	179	97.81%
	Ovarian volume of more than 9 cm^3	4	2.18%

To eliminate the potentially confounding bias of age and BMI, we carried out multivariate analyses in Table 2. Indeed, LH/FSH and total testosterone were positively correlated with the disease (regression coefficient = 0.2 and 0.06, respectively, with P = 0.03 and 0.02, respectively). However, FSH, SHBG, and progesterone were negatively correlated with the disease (regression coefficient = -0.02, -0.004, and -0.2, respectively, with P = 0.05, 0.02, and 0.002, respectively).

Table 2: Age and BMI adjusted comparison of reproductive hormones

VARIABLE	Regression coefficient	*P* value
LH	0.04	0.18
FSH	-0.02	0.05
LH/FSH	0.2	0.03
E2	0.001	0.6
DHEA - SO4	-0.002	0.92
SHBG	-0.004	0.02
TOTAL TESTOSTERONE	0.06	0.02
PROLACTIN	0.003	0.5
PROGESTERONE	-0.2	0.002
CORTISOL	0.002	0.8

Discussion:-

In this study, we have assessed the clinical presentation along with measuring the level of reproductive hormones of Saudi women diagnosed with PCOS according to the Rotterdam criteria. The importance of our study lies in the fact that studies describing PCOS in the Saudi population are very scarce.

In our studied population most of the participants were 38-45 years old (42.08%) although PCOS can occur throughout reproductive age [19]. Other study show that PCOS can occur in younger age group up to 9 years old [20]. In addition to that (33.88%) of them were class obesity with BMI between 35 - 39.9 which reflects the fact that obesity is a common finding in PCOS and also in the general Saudi population although obesity is not part of the diagnostic criteria. In the literature, BMI has been suggested to influence the levels of reproductive hormones with some contradictory results. Indeed, some studies found that higher BMI was associated with lower LH [21-22-23-24], but others described that BMI had no influence on LH [25-26]. On the other hand, recent research has indicated that age can also influence both the clinical presentation and metabolic manifestations of PCOS [27-28].

In fact, the results of the multivariate regression analyses confirmed that regardless of the age and weight factor, cases had higher levels of LH/FSH and total testosterone, and that cases had lower level of FSH, SHBG, and progesterone. Even in the adjusted comparison, we could not find a significant increase in LH levels. Unlike the previous published studies [15-16], we have failed to find a significant increase in LH in patients with PCOS. A major factor that tends to affect the results is the variation of hormonal level with the menstrual cycle. According to a published study [12], elevated LH levels are not very reproducible in the early menstrual cycle, which was the time at which we measured LH in this study. Furthermore, it was previously demonstrated that LH is more elevated in lean PCOS patients compared to obese PCOS patients [17] and having most of our patients with BMI >25 (75.41%) could have been a major influence of the results. Several studies in the literature have reported that not all PCOS patients have elevated LH [15-16-29], and this could be very well the reason why the average increase in LH observed in our study was not statistically significant. The absence of data on insulin levels has impacted some constraints on the interpretation of the hormonal findings.

Recommendations:-

Future studies with a larger number are required to further clarify the hormonal variations in PCOS. Another limitation is the unavailability of a measurement for insulin level for the study subjects.

Conclusion:-

Elevated levels of LH/FSH and testosterone and reduced FSH, SHBG, and progesterone were predictors of PCOS. This was independent of BMI or age. Future studies with larger sample size and data on insulin levels are needed for greater understanding of the manifestation of PCOS in the Saudi population.

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