Measuring the concentration of some hormones in patients sera of polycystic ovaries

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Abstract:

Extensive evaluation of 76 women with polycystic ovary syndrome compared with 25 fertile women as control group was achieved by routine investigations and hormonal study of each female which were done in one period during the menstrual cycle. Then the women with PCO_S have been divided into 2 groups according to their menstrual cycle (irregular menstrual cycle) during assessing their hormonal profiles as follow:-

1- (54) Patients with oligomenorrhea.
2- (22) Patients with menorrhea.

This study shows that the women with PCOs have different clinical features taken from a history of disease of all of the women.

Those features were distributed as follow: 57.92% of them suffer from hirsutism. 19.24% suffer from irregular menstrual cycle, obesity in 67%, 9 patient with acne vulgaris, and more than 50% of them have most of the clinical symptoms at same time. It is also found that the hormonal disorder is the main cause of this disease with other cawes.

Key words: LH, FSH hormones, poly cystic ovaries

Introduction:

Polycystie ovary syndrome (PCOs) is a common condition characterized by menstrual abnormalities and clinical or biochemical future of hyperrandrogensim [1,2]. And it can be defined as a hormonal imbalance that can cause irregular periods and acne on ovulation in reproductive age [3,4]. The name of (PCOs) is given because one of the most common results of these diseases is the formation of many cysts on the ovaries, but the problems it produces are manifold [3]. Although (PCOs) is known to be associated with reproductive morbidity and increased risk for endometrial Cancer, so (PCOs) is one of the most common endocrine disorders [5]. Although its etiology remains unknown but it is involved with aberration of substance that lead to follicular growth [6]. (PCOs) is associated also with an ovulatory infertility and metabolic disturbances [7]. The classical symptoms of (PCOs) include infertility, amenorrhea of signs of hirsutism and obesity as originally described by stein and Leven that in 1935. However, the clinical significance of polycystic ovary in asymptomatic women is still under investigation[8-10]. Many complications arise from this disorder which include: hormonal imbalance, infertility, adult acne, a hump on the upper back, patches of the dark skin under the arms, male-pattern baldness, adrenal hyperplasia, high blood pressure and obesity[11]. Ovaries are slightly enlarged and contain 6 or more cysts located at which have leed to the descriptive term, the size of these cysts general can be usually be detected by ultrasound examination [12].

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Materials and Methods:

This study was carried out on seventy six patients with (PCOs) with age ranged between (16-40) years during the period of nearly one year, which obtained from Kamal Al-Samaraay hospital /Baghdad, and Al-Kadhimya teaching hospital/Baghdad, also twenty- five normal regular-menstruating women with proved fertility, whose age ranged between (15- 45) years, act as the control group.

Table (1) summarized the variable of subjects under study.

groups	Number of patient	Age Range (year)	Mean (year)
Controls	25	15-45	30
Patients	76	10-40	28

The patients were presented with menstrual irregularities (menstrual cycle length was between 50 day and 6 months), (mean ± SD) days.

Centrifugation of the fasting blood sample was done at 3000 rpm to separate serum samples. Then transferred into plastic cuvettes, which was used of measuring hormones, the tubes were stored at -20ºC until analysis.

Hormonal assay kit:

FSH, LH and Testosterone were estimated by mini VIDAS using a biomerieux kits Sa. 69230 marcy I'Etoile- France (No. 06268I, 06267 K and 09345 B respectively.

At the end of the assay, results are automatically calculated by mini VIDAS in relation to the calibration curve stored in memory, and then printed out. All the previous steps were also applied LH and testosterone hormones in order to measure the concentration in all PCOs samples unit.

Results:

The level of LH and FSH in sera of PCOS and control groups were indicated in table (2). There was an increase level of LH in PCOs group compared with that found in control group, this difference is statically significant ($p < 0.05$),also there was a significant differences between control and PCOs group for FSH level ($P> 0.05$), LH/FSH ratio was significally higher than normal control (($P> 0.05$) (table 2). Also testosterone levels in PCOs was more than that found in the control group (Table 2).

1- Luteinzing hormone (LH):-

Serum LH levels obtained was elevated in (79.25%) of PCO_S patients studied and reached to 14.855±1.21 µIU /ml as compared with the control group(6.2±1.0 µIU /ml) which is statistically significantly ($p < 0.05$), there was no significant difference between the two subgroups of PCOS (Fig 1).

2- Follicle stimulating hormone (FSH):

Serum FSA level was decreased in 63.87 %) of PCO_S patients and reached to (6.12 ± 0.88 µIU /ml) as compared with the control group (8.30±0.8 µIU /ml) and the P values was statistically significant.

3- LH/FSH ratio

LH/FSH ratio was markedly elevated in(61.08%) of PCOs patients and reached to (2.28 µIU) as compared with that found in the control group, which was statistically significant. The highest levels of LH/FSH values were found in PCOs with amenorrhea (3.88) No significant differences were found in aligomenorrhea group (Fig 1).

4- Testosterone (T)

Serum testosterone in patients with PCO_S was markedly elevated in (58.8%) and reached to (3.87 $\pm$ 1. µIU /ml) which was significantly higher than that found in control (2.17 $\pm$ 0.61 µIU /ml). Highest T levels were found into two groups (Fig 1).

Discussion:

Hormonal status profile in PCOs:-

The explanation of normal LH in PCOs might be based on typical and a typical PCOs in which LH level might be normal or might be due to increase pulse frequency or episodic secretion of LH as reported previously[14]. In spite of having normal base line LH levels[13].

Serum FSH levels in patients with PCOs were lower than that found in control group which were compatible with other studies but incompatible with reports of finding high FSH levels in case of raised LH levels in PCOs in England[13]

The explanation of higher LH/ FSH ratio might be due either to primary central disorders involving GnRH secretion or secondary pituitary sensitization to GnRH by an abnormal feed back signals from ovaries as suggested by other studies. Estrogens were able to increase LH response to GnRH compared with FSH, mainly if unopposed by progesterone that might lead to absence of negative feed- back mechanism on LH puls frequency in response to different GnRH pulse patter.

This could explain the highest LH/ FSH ratio in amenorrhiea group. Still there were controversies about the role of inhibin in preferential inhibition of FSH and not LH rendering elevated LH/ FSH ratio in PCOs in general as mentioned by many studies [15, 16].

Serum Testosterone levels of patients with PCOs whether had hirsutism or not were significantly higher than normal control. Highest levels of testosterone were found in patients with amenorrhea and oligomenorrhea in PCOs, which agreed with some studies [17,18]. Excess androgen secretion in PCOs is not always ovarian in origin, might be adrenal excess is the intial event that could transform into polycystic appearance. Nevertheless other suggest that increased androgen levels are a result and not cause of this endocrine disorders [19].

Table (2): Concentration of serum LH, FSH, and FSH:LH ratio & testosterone hormones in PCOs and control groups

	Hormonal assay (m. ± SE)			
	LH (µIU/ml)	**FSH (µIU/ml)**	**Testosterone (µIU /ml)**	**LH:FSH Ratio %**
PCOs	A 14.00±1.21	A 6.12 ± 0.88	A 3.87 ± 1.48	2.28
Control	B 6.20 ± 1.01	B 8.30 ± 0.8	B 2.17 ± 0.61	0.74

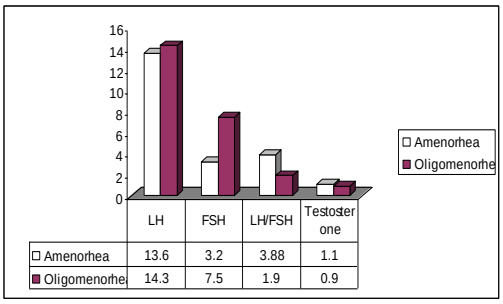

Fig. (1): Serum of hormones levels among the sub-groups of female with PCOs

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قياس تركيز بعض الهرمونات في امصال مريضات متلازمة تكيسات المبيض

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الخلاصة:

انجزت هذه الدراسة على 76 امرأة مصابة بنوع من انواع العظم الاولي (متلازمة تكيسات المبيض) وتمت مقارنة النتائج بـ 25 امرأة طبيعية التشخيص الهورموني بعد اجراء التحاليل الروتينية للعقم وتحت الدراسة في مدة واحدة من الدورة الشهرية.

قسمت النساء المصابات بالمرض الى مجموعتين اعتمادا على نوع الاضطرابات في الدورة الشهرية وكالاتي:

1-54 مريضة ذات طمث قليل او متباعد.

2-22 مريضة ذات طمث غزير في الدورة الواحدة.

وقد كان اضطراب الهرمونات هو السبب الرئيس في ظهور اعراض هذا المرض فضلا عن اسباب اخرى، اذ ارتفع الهرمون المحفز للجسم الاصفر LH وهرمون التوستيرون Testostrone عند مقارنته بمستوى السيطرة، بينما انخفض مستوى هرمون محفز الجريبات FSH