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Measuring the concentration of some hormones in women with polycystic ovary syndrome

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Abstract---This study was conducted at the Women and Children's Hospital in Al-Qadisiyah from 1/10/2021 to 2/1/2022, and 50 patients were followed up for women suffering from polycystic ovaries on the third day of the menstrual cycle, and compared to the control group, which included 50 normal cases, which were confirmed to be free. Of the chronic diseases such as heart disease, thyroid, diabetes and blood pressure, the concentration of hormones was measured for both infected and non-infected women, including PRL, LH and FSH. A significant increase in The results showed a significant increase in prolactin and FSH, LH was observed in women with PCOS compared to the control group.

Keywords: hormone, prolactin, LH, FSH.

Introduction

Polycystic ovary syndrome (PCOS) is a relatively common endocrine disease in gynecology mostly affecting women of reproductive age, with an incidence of about 6%–21%[1]. It is characterized by chronic anovulation, excess androgen secretion, and insulin resistance (IR). Its etiology is still unknown. PCOS is also associated with insulin resistance in surrounding tissues, hyperinsulinemia, and abnormal degree of obesity and is one of the most common causes of menstrual irregularities in adolescent women giving birth. The menstrual cycle mainly depends on the hormone regulation of the “hypothalamic-pituitary-ovarian axis”[2] which is manifested as periodic endometrial exudation, and the mechanism of PCOS is the abovementioned functional abnormalities and metabolic changes with the change of living habits and diet structure, as well as the increase of life pressure, patients are easily affected by anxiety and other factors, resulting in a significant increase in the incidence of PCOS menstrual

irregularities, which may cause reproductive disorders in patients, seriously affect their physical and mental health and quality of life, and even affect their family harmony[3].

At present, the western medicine treatment of PCOS is mainly aimed at establishing a normal menstrual cycle with ovulation, restoring patients' fertility and eliminating clinical manifestations such as hirsute. It takes estrogen, progesterone symptomatic treatment. Treatment methods include the use of drugs to regulate the menstrual cycle, reduce androgen levels, improve insulin resistance, and induce ovulation, which has achieved a certain effect. However, clinical needs have not been fully met. For example, long-term hormone therapy may cause nausea, vomiting, breast tenderness, and other adverse reactions in some patients, affecting their confidence in treatment, and long-term application of hormone drugs may lead to a series of adverse reactions or drug dependence[4]. Therefore, it is particularly important to select an adjuvant therapy with high safety, strong selectivity, and fewer adverse reactions. TCM treatment is based on the overall regulation and has the characteristics of precise curative effect and safety [5].

Methods

A total of 100 subjects, healthy controls (n = 50) (G1), and 50 women with PCOS (G2) were included in this study. The mean age of the control group (45.12 ± 11.9 years), the age of the G2 patient groups (45.12 ± 14.7) years, (54.33 ± 8.7) were selected in the period from 1-10-2021 to 2-1-2022. This study, including blood samples and experiment protocols, was approved by the Ethical Committee of Women's and Children's Hospital in Al-Qadisiyah Governorate. in addition to , . Additionally, obtain informed consent from all study participants prior to sample collection. 5 ml of blood was collected in gel tubes, and then the plasma was separated by centrifugation (4000 rpm, $0.894 \times g$) (Gottingen, Germany) at room temperature for 10 min. Study samples were divided into Eppendorf tubes. Measurement of plasma levels of PRL, FSH, and LH by ELISA kits (Elabscience, China).

Statistical analysis

All values were expressed as mean $\pm$ standard deviation for normally distributed data and as median (inter quartile range) for skewed data. Differences between the two groups were analyzed using Mann-Whitney U test. A p-value less than 0.05 was considered as statistically significant. Statistical analysis was done by using Microsoft excel spread sheets and SPSS for windows version 11.5 (SPSS, Inc; Chicago IL).

Results and Discussion

Table 1
Show the concentration of PRL and FSH, LH in PCOS

Groups	PRL mean± SD	p- value	FSH mean± SD	P- value	LH mean± SD	p- value
G1	7.18±0.8	<0.05	5.4±1.5	<0.05	5.43±0.32	<0.05
G2	16.98±1.9	<0.05	5.8±0.5	<0.05	16.36±0.5	<0.05

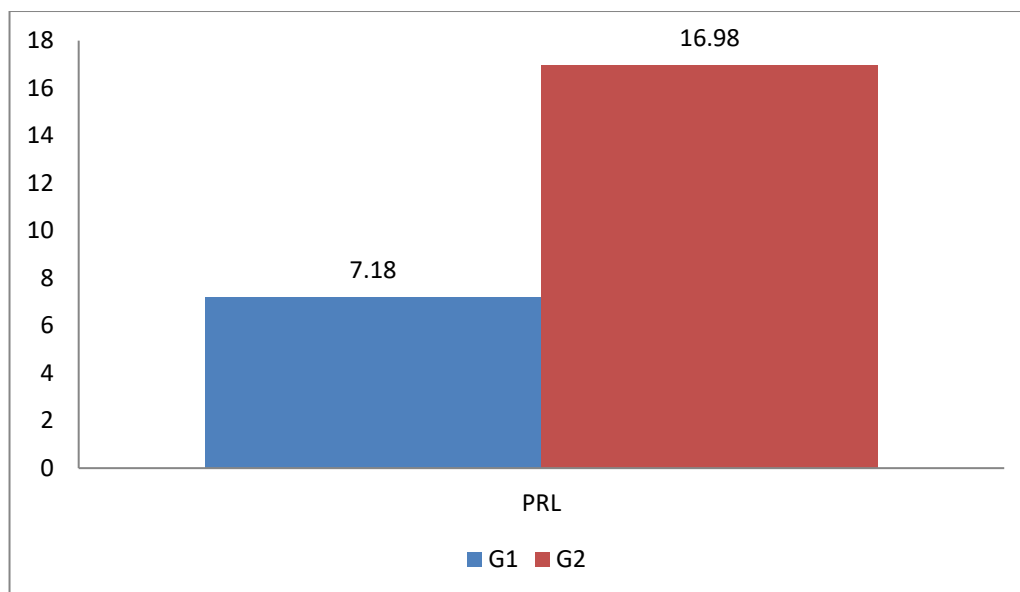


Figure 1. Mean values for PRL in PCOS patients and control group

Hormonal study of women with PCOS Prolactin hormone

It is evident from Table and Figure (1) a significant increase in the level of the hormone prolactin in the serum of women suffering from polycystic ovary syndrome, a significant ($P > 0.05$) rise, it reached (16.98 ± 1.9) ng/ml compared to With the control group (7.18 ± 0.8) ng/ml, this was consistent with what was indicated by[6] showed that the hormone prolactin inhibits the aromatase activity of the ovarian granulosa cells and thus supports the theory of the role of prolactin in suppressing follicular maturation[7]. (Boon., 2006) factor (PIF) It is possible that the increase in the incidence of polycystic ovary syndrome may lead to a state of psychological and neurological disorder in women with this syndrome, and this leads to their suffering from severe anxiety or what is called psychological confinement[8]. (Anxiety), as it is scientifically recognized that the concentration of the hormone prolactin rises significantly in the bloodstream under the influence of stress resulting from deteriorating health and psychological conditions, it was entrusted by[9]. The physiological factors that cause a significant increase in the concentration of the hormone are stress, pregnancy, lactation, sleep and exercise. It also rises with the effect of some drugs and

antibiotic[10]. The hormone prolactin does not have a releasing factor of its own, but the hypothalamus secretes a neurosecretory substance that inhibits the secretion of the hormone prolactin and is called the inhibitory factor. Prolactin and Spielman) to Prolactin Inhibiting[11].

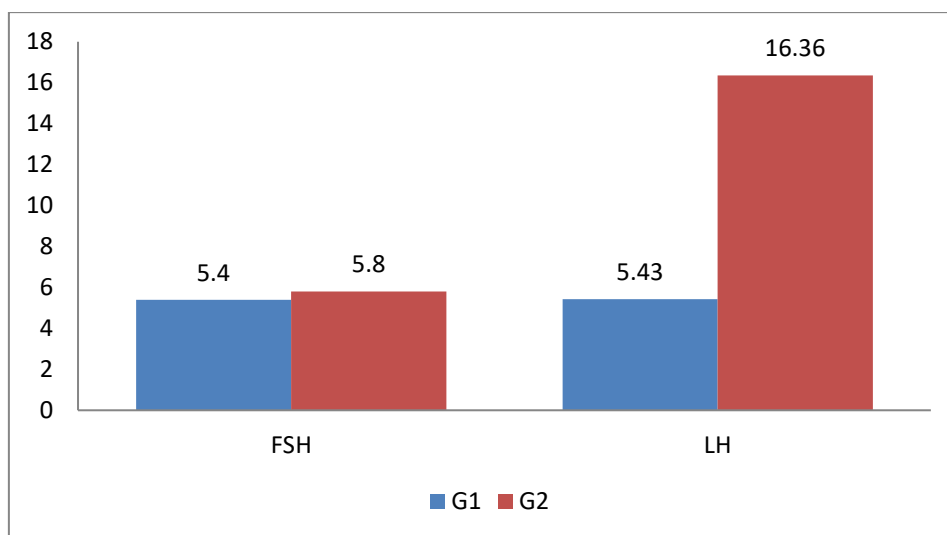


Figure 2. Mean values for FSH and LH in PCOS patients and control group

B. Pituitary hormones (LH-FSH). The results of Table and Figure (2) indicate an increase in the average concentrations of the gonadotrophin hormones, namely, follicle stimulating hormone (FSH) and luteinizing hormone (LH). The level of LH hormone in PCOS women reached $(16.36 \pm 0.55.43 \pm 0.32)$ mIU / ml at a high significant level ($P < 0.05$) compared to the level of LH in the control women, whose average concentrations of the hormone (5.43 ± 0.32) milli IU / ml, while the average concentration of FSH was (5.8 ± 0.5) in the women infected with PCOS compared to the mean measured in control women (5.4 ± 1.5) mmIU/mL The growth of ovarian follicles is under the control of FSH and LH hormones, so Brown (1978) suggested that the ovarian response is when FSH reaches the desired level and that the level of FSH is heterogeneous during the follicular phase due to the growth of the follicle and sensitivity to stimulate the nutrients of the candida, as LH stimulates ovulation and then stimulates the corpus luteum to form steroid hormones (steriodogenesis) [12]. but a high level of it suppresses the activity of aromatase and inhibits the growth of oocytes [13] as this study indicates an increase in LH hormone in the follicular phase compared to the control sample, and this leads to hormonal disturbance and thus the absence of ovulation.

The pituitary gland and the hypothalamus are among the main organs that regulate the mechanism through which the endocrine system operates in the anterior lobe of the pituitary gland, the portal system works to produce peptides that bind with specific receptors located on the surfaces of cells. Hormone release or hormone inhibition[14]. The hypothalamus stimulates the production of gonadotropins from the pituitary gland through pulsatie production of gonadotropin-releasing hormones, thus stimulating the genetic transcription of

gonadotropins LH and FSH[15]. when the pulse frequency (release rate) of the releasing hormones for gonadotropins increases, this leads to stimulating the reproduction of the B sub unit of the LH more than the ovarian follicle-stimulating hormone. Conversely, the decrease in frequency or Pulsed repetition of the rate of release of gonadotropin-releasing hormones inhibits the transcription of the beta subunit of LH and thus reduces or decreases the transcription of LH more than Haisenleder et al. Some researchers have stated that any change in the information received by the nervous system caused by the hormone insulin, insulin-like growth factor (IGF) and steroids may cause a disturbance in the impulse release of hormones releasing gonadotropins[16]. The process of producing androgens from androstenedione and estrone may increase the sensitivity of the pituitary glands to the hormones released from the gonads, as well as its effect on increasing the sensitivity of the hormones liberating to gonadotropins to their receptors on cell surfaces, which contributes in a way Effective in causing diseases or showing pathological symptoms associated with polycystic syndrome, and consequently, a significant increase in the concentration of LH in the blood and an increase in the speed of its response to the gonadotropic nutrients[16].

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