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ASSESSMENT OF REPRODUCTIVE HORMONES AND ANTI-FSH ANTIBODIES IN INFERTILE IRAQI WOMEN

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Abstract:

Infertility is a multi-faceted condition that affect couples around the world and in many cases it is related to hormonal and metabolic imbalances among women. The aim of this study was to compare hormonal data between infertile women and controls. ***Methodology***: A clinical trial conducted at Al-Kadhimiya Teaching Hospital (Umm Al-Baneen Centers for Infertility and IVF), 100 samples were collected, 60 patients, forty control individual of age group between 20-40 years aged. We tested all of them on second day of menstrual cycle. and determination of follicle-stimulating hormone (FSH), luteinising hormone (LH), anti-FSH, testosterone and prolactin. Demographic information such as age and weight also was gathered. ***Results:*** There was a significant increase in serum FSH, LH, Anti-FSH and prolactin levels in the infertile subjects when compared with the controls ($P \leq 0.01$), testosterone was high also in patients; but not significant difference. In addition, the patients were overweight which shows that obesity maybe one of causes determining infertility. These findings

suggest that hormonal imbalance may be involved in infertility and that the evaluation of hormonal dynamics should be considered for clinical study and management of female reproduction. And research in this area has also revealed that the immune system is key for fertility- and not merely with regard to implantation of an embryo in a woman's uterus but also when it comes to semen quality and sperm function. ***Conclusions:*** Hormone profiles and anti- FSH antibodies may be useful diagnostic tools in the feminine infertility work-up. Control monitoring of these parameters may assist in the optimization of clinical results and help tailor treatment of the individual patient.

Key words: Anti-FSH, FSH, Infertility, LH, PCOS

1.Introduction:

Infertility is a sexual reproductive system disease that follows the World Health Organization (WHO) as 'the inability to achieve clinical pregnancy after more than 1 year of unprotected sexual intercourse[1]. It is a well-recognized burden to public health, affecting 8 to 12% of couples globally. Infertility can have a profound negative impact on the social, emotional, physical, financial well-being of infertile couples. It can also influence marital stability, job performance, and family dynamics [2]. There are two kinds of female infertility: primary infertility refers to a woman who cannot get pregnant or carry a pregnancy to term, while secondary infertility means a woman has already had one or more pregnancies. It has been shown that primary infertility occurs in 1.9% of couples, while secondary infertility affects up to 10.5% [3]. While infertility was traditionally viewed as an issue for women, studies increasingly find that half the time a situation will arise in which (hetero) sexual intercourse will be affirmed to favor one gender over another. The woman is single cause or risk factor in 40% of infertile couples and the man is responsible for another 40%. The remaining 20% are referred to as unexplained infertility, in which no cause is detected [4]. FSH plays a role in the control of the menstrual cycle in women and the production of eggs from the ovary [5]. FSH levels change throughout the menstrual cycle, they are highest just before an egg is released (ovulation). Elevated FSH may signal a depleted egg supply or abnormalities in ovarian function, including premature ovarian failure and polycystic ovary syndrome. Low levels of this hormone may also cause menstrual problems or irregular ovulation, which can make it harder to get pregnant[6].The intriguing and complex issue of the immunology and fertility connection has historically been a subject that captured the attention of scientists as well as individuals interested in knowing more about human's ability to reproduce themselves[7].

The aim of study:

The objective of the present investigation is to assess and compare the hormone levels (FSH, LH, Anti-FSH, testosterone and prolactin) in infertile women with normal healthy controls. It further aims to test to see if there is a relation between body weight and endocrinoses in infertile women who were visiting Al-Kadhimiya Teaching Hospital (Umm Al-Baneen Center for Infertility and IVF)

2. Methodology:

The total number of participants was 100; where 60 females with infertility and 40 controls. The current investigation was carried out from February to June 2025 at Al-Kadhimiya Teaching Hospital – Um Al-Baneen Center for Infertility and IVF, located in Baghdad, Iraq. The enzyme-linked immunosorbent assay (ELISA) was utilized to measure the serum levels of Prolactin, Testosterone, FSH, LH and Anti- FSH. The data were examined with the origin lab software version 25[8]. The study groups were analyzed by Analysis of variance (ANOVA).

3. Results:

Table (3.1) showed the difference in ages and body weight between patients and control.

Table 3.1: Comparison between control and patient groups in Age and Body weight

Group	Means ±SE	
	Age (year)	Body weight (kg)
Control	27.40 ±1.26	59.40 ±1.69
Patients	26.61 ±0.86	84.67 ±2.87
T-test	2.962 NS	7.709 **
P-value	0.596	0.0001
** (P≤0.01), NS: Non-Significant.		

Table (3.2) reveals that the Mean ±SE of FSH in patients was higher than that of control at P≤0.01, and the P-value was 0.0001. There is a highly Significant differences between them.

Table 3.2: Comparison between control and patient groups in FSH

Group	**Mean ±SE of FSH (mIU/mL)**
Control	20.93 ±1.31
Patients	37.08 ±0.59
T-test	2.587 **

P-value	0.0001
** (P≤0.01).	

Table (3.3) reveals that the Mean ±SE of anti-FSH in patients was higher than that of control at P≤0.01, and the P-value was 0.0001. There is a highly Significant differences between them.

Table 3.3: Comparison between control and patient groups in Anti-FSH

Group	Mean ±SE of Anti-FSH (ng/mL)
Control	21.32 ±1.78
Patients	38.01 ±0.24
T-test	2.930 **
P-value	0.0001
** (P≤0.01).	

Table (3.4) show that the Mean ±SE of LH in patients was higher than that of control at P≤0.01, and the P-value was 0.0001. There is a highly Significant differences between them.

Table 3.4: Comparison between control and patient groups in LH

Group	Mean ±SE of LH (mIU/mL)
Control	9.93 ±0.76
Patients	15.84 ±0.33
T-test	1.484 **
P-value	0.0001
** (P≤0.01).	

Table (3.5) show that the Mean ±SE of Testosterone in patients was higher than that of control at P≤0.01, and the P-value was 0.0001.There is a non-Significant differences between them.

Table 3.5: Comparison between control and patient groups in Testosterone

Group	Mean ±SE of Testo.(ng/mL)
Control	0.195 ±0.02
Patients	1.461 ±0.06
T-test	0.154 **

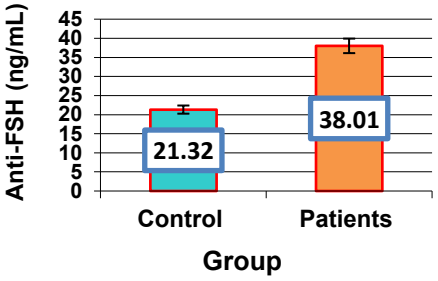
P-value	0.0001
NS: Non-Significant.	

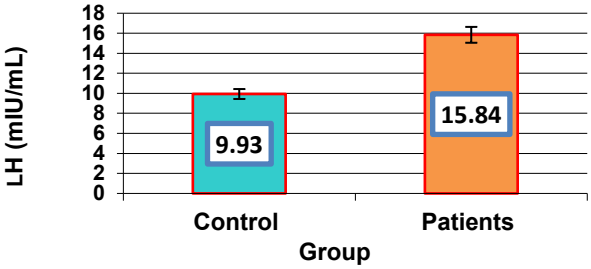
Table (3.6) show that the Mean ±SE of Prolactine (PRL) in patients was higher than that of control at P≤0.01, and the P-value was 0.0001 There is a highly Significant differences between them.

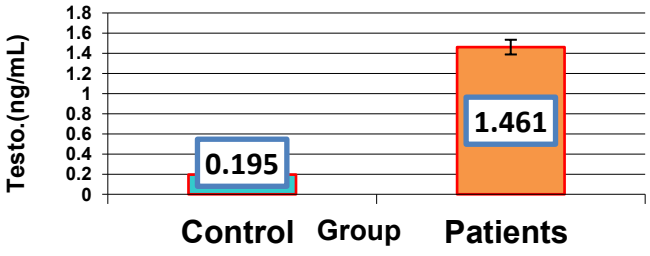
Table 3.6: Comparison between control and patient groups in PRL

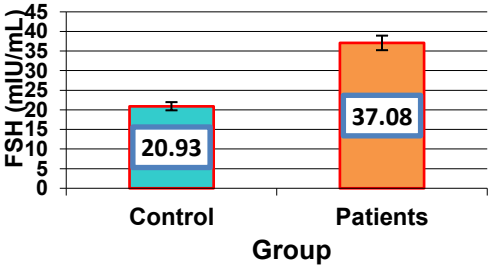
Group	Mean ±SE of PRL(ng/mL)
Control	16.53 ±1.27
Patients	30.28 ±0.88
T-test	3.015 **
P-value	0.0001
** (P≤0.01).	

Figure 1 showing a comparison between control and patient groups in the levels of FSH, anti-FSH, Testosterone, Prolactine and LH.









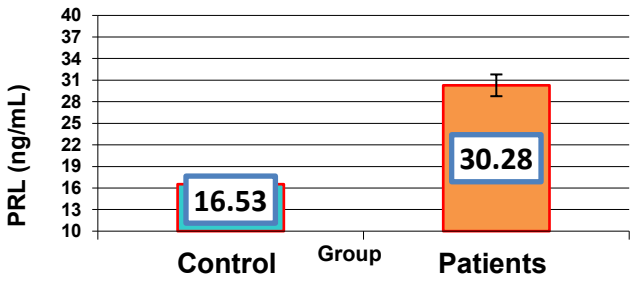


Figure 1: comparison between control and patient groups in the levels of FSH, anti-FSH, Testosterone, Prolactine and LH.

5. Discussion:

Autoimmune Infertility is when a problem with the immune system causes it to create anti-bodies that attack healthy reproductive cells. These autoantibodies may be directed against various reproductive antigens including the endometrium, ovary tissue, sperm and phospholipids [9,10]. The pathogenic role of such antibodies in infertility is complex and multi-factorial. They can activate complement pathways, which result in a release of proinflammatory cytokines and local inflammation, which subsequently results in tissue damage or unsuccessful embryo engraftment [11,12,13]. This study investigated hormonal differences between infertile women and healthy controls. While age showed no significant difference between groups. Body weight was significantly higher in the infertile group, indicating a link between obesity and hormonal imbalances affecting fertility, this result is in agreement with the finding of [14], confirmed the impact of obesity on ovulatory function and infertility.

Hormonal profile of infertile patients show highly increase average in FSH, LH, anti-FSH and prolactin with homogen responses was P = 0.0001 indicating affection in HPOA. There was also an higher expression of testosterone itself in the patients, not statistically significant, likely because of sample size. Elevated prolactin and Anti-FSH levels may also indicate autoimmune or pituitary related cases. These results are in line with those of [15] which showed high LH and testosterone levels were found in PCOS patients. Our results further confirm the findings by [16] were able to detect higher levels immediately at the first cycle of treatment in the sera Anti-FSHirl antibodies in women with unexplained infertility, indicating that an autoimmune mechanism would somehow interfere with ovarian function. Further, with regard to prolactin level our finding consistently agreed with [17] who were correlated hyperprolactinemia with ovulatory dysfunction.

Conclusions:

Hormone profiles and anti- FSH antibodies may be useful diagnostic tools in the feminine infertility work-up. Control monitoring of these parameters may assist in the optimization of clinical results and help tailor treatment of the individual patient.

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