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A statistical study of the high prolactin hormone and its relationship to male and female infertility in the Najaf district

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P A P E R I N F O

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A B S T R A C T

Aim of study: Toward studying the effects of prolactin, LH, and FSH hormones on male infertility in Najaf district.

Methods: One hundred and sixty-four healthy, fertile men and women served as the control group, whereas 184 infertile men and women from enrollments came from the Infertility Center, Al-Sadr Medical City, and Al. Najaf City. They are in the age range of 20 to 70.

Results: According to the findings, the LH mean ± st the control group's IU/L was 4.37±0.35. There were notable variations in the F.S.H. value (8.74±1.43IU/L).

andard deviation was 16.25±4.6 IU/L, whereas the value for the control group was 4.37±0.35 IU/L. Significant differences were seen in the F.S.H. value (8.74±1.43IU/L) between the infertile patient group and the control group (men and women) (5.33±0.44IU/L).,

Prolactin levels in the patients were 53.12±5.68 (IU/L) and 19.25±1.23 (IU/L) in the control group, respectively. There was no statistically significant difference between the control group and the cases study. The same can be said about control group or the cases study.On the other hand, levels of prolactin and F.S.H. fall modestly with age, whereas levels of L.H. increase.

Conclusion: The findings of this study indicate that in order to classify infertility patients into male and female groups and estimate a comprehensive case and control, research should be carried out for both male and female infertility due to the hormonal imbalance of L.H., F.S.H., and prolactin.

1. INTRODUCTION

Prolactin is a polypeptide hormone that is responsible for lactation in mammals, breast growth, and a variety of other functions. Prolactin is made up of 199 amino acids, followed by proteolytic cleavage of the signal peptide from the prolactin prohormone (pre-prolactin), and finally post-translational modification. Prolactin is secreted from the anterior part of the pituitary gland and its secretion is under the control and regulation of the hypothalamus. The immunological system, the uterus, and the mammary glands, in addition to the central nervous system, are all capable of producing prolactin [1]. Prolactin has regulating properties. Prolactin is generated by a number of different organs, although its expression is highest in the pituitary gland [2].

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vertebrates, but it was already largely expressed in specific cells in the pituitary in fish, and prolactin was released into the bloodstream as a multifunctional hormone. That is a class of cytokines based on the structure and type of receptor prolactin. Pituitary hormones consist of prolactin and growth hormone. The structure of prolactin and growth hormones differs from that of other pituitary hormones. Prolactin is also uncommon among adenohypophysis hormones in that it does not have an endocrine gland target, facilitate its functions, but it now acts directly through prolactin receptors found in a number of target organs [3]. The majority of prolactin's primary targets are epithelial cells, on which it can have proliferative effects as well as faster gene manifestation and even faster molecular actions [4].

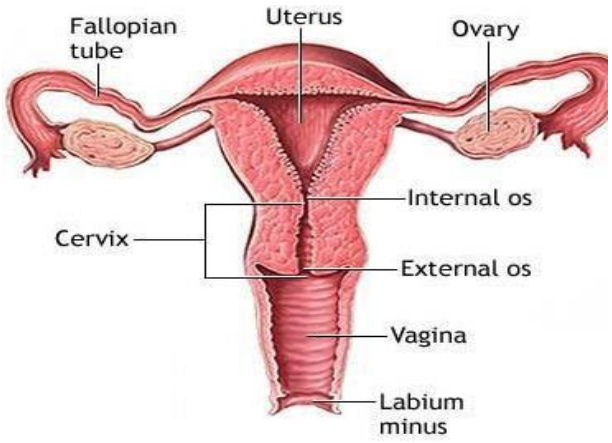

Figure1. Explained the reproductive system of women [1].

Breastfeeding and the growth of breasts are regulated by the polypeptide hormone prolactin. Proteolytic enzymes cleave the prolactin prohormone's signal peptide, or pre-prolactin, and post-translational modification occurs next. 199 amino acids make up prolactin. The anterior pituitary gland region produces prolactin, which the brain regulates and controls. In addition to the central nervous system, other organs that can produce prolactin include the uterus, mammary glands, and the immune system [3]. The hormone prolactin is characterized by its regulating properties. Although it is produced by many organs, the pituitary gland produces the most of it [4].

Prolactin was widely synthesized in specific cells in the fish pituitary before it was released into the bloodstream as a multifunctional hormone in vertebrates. Prolactin receptor type and shape indicate that this is a class of cytokines. The pituitary produces two hormones: growth hormone and prolactin. Prolactin and growth hormones are not the same structure as other pituitary hormones. Prolactin is distinct from other adenohypophysis hormones in that it now functions directly through prolactin receptors found in a range of target organs, rather than relying on an endocrine gland target to assist it in its duties [5]. Prolactin primarily acts on epithelial cells, where it can promote proliferation and accelerate gene expression and molecular activity [6]. Complicated medical conditions have affected people worldwide, exacerbating psychosocial and economic problems. In addition, it's believed that between 60 and 80 million couples worldwide struggle with infertility annually [7]. The pituitary glands in both sexes generate L.H., a hormone associated with women. Together with other hormones, it regulates the menstrual cycle F.S.H) [8] .

At higher than normal levels of (L.H) in females may indicate the following: the pituitary gland is malfunctioning, the ovaries are absent or not functioning, Ovulation, or the release of the egg from the ovary is taking place, and both the male and female hypothalamus are under stress [9], wellness that promotes productivity in both men and women. Furthermore, there is a connection between men's and women's sexual satisfaction and Prolactin Stimulates Lactation (PSL) [10].

2. MATERIALS and METHODS

This research comprised 164 infertile patients, both male and female. The patients were recruited from the infertility center in October 2020 to April 2021 in Al-Sadr Medical City and Najaf City. They range in age from twenty to seventy. The control group included one hundred people in good health,both male and female, whose ages matched those of infertile couples and who showed no outward symptoms of disease.

2.1. Hormonal Test

All three hormones under study—prolactin, L.H., and F.S.H.—were measured utilizing the Bio.Tek. Instruments 217337, U.S.A. Enzyme-Linked Immune Sorbent Assay (ELISA) apparatus. It takes prolactin for them to be able to produce.

2.2. The Statistical Examination

The Standard Error (SE) represents the average value of the data. The Student t-test and Pearson's correlation coefficients in the concentrations of L.H., F.S.H., and Prolactin were used to evaluate the data [11].

3. RESULTS AND DISCUSSIONS

Infertility is a public reproductive disorder that is marked by a couple's inability to conceive after at least a year of frequent, unprotected sexual contact. Stress affects men and women equally, and chronic stress can result in major health problems, depression, and anxiety disorders [12]. An essential component of their capacity to procreate is (prolactin). Hormonal disorders that affect ovulation include hyperprolactinemia, hypoprolactinemia, and hyperthyroidism. Recently, the diagnosis and causes of infertility have been studied with a focus on hormonal imbalances. Furthermore, an increase in the proportion of females (F.S.H.) may indicate a decline in the number of embryos and Good Quality Eggs (GQE) created for fertilization. Depending on her age, a woman may have fewer odds of becoming pregnant than she would have thought. Pregnancy is not difficult to achieve in spite of this. She might struggle to conceive and need infertility therapy [13].

Table 1 shows that Scott et al. (1989) and Ban et al. (2013) concur that infertility is associated with a hormonal imbalance. Numerous anthropometric and socioeconomic parameters have been related to fecundity.Therefore, an assessment of the prolactin, LH, and FSH levels in infertility was conducted.It had greater levels of FSH, LH,

and prolactin. These results are in line with research conducted in 2013 by Ban *et al*. and Aroma *et al*. Higher levels of the hormone prolactin are often linked to infertility rather than fertility, according to studies by Scott MG *et al.* (1989) and Choudhury *et al.* (1995) [14].

TABLE 1. Age, FSH, LH, and prolactin levels are the outcomes of infertility in both men and women.

	type	Cases(164)	Mean ± SE	P-value
Age	male	42	38.48±2.27	0.486
	female	121	36.67±1.31	
F.S.H I.U/L	male	42	3.43±0.81	0.105
	female	121	5.31±0.62	
L.H I.U/L	male	42	8.66± 2.90	0.681
	female	121	7.59±1.16	
Prolactin.	male	42	22.06± 2.49	0.112
I.U/L	female	121	31.06± 3.19	

Table (2) displays the age and hormone levels for the control group (male and female) and the investigative cases (female and male infertility). For LH, the value was 16. 25±4.06 IU/L, while for the control group, it was 4.37±0.35).The (F.S.H.) value for infertility cases (8.741.43) IU/L differed statistically from the value of the male and female control group. The case group had prolactin levels of 19.251.23 IU/L and the control group had 53.125.68 IU/L. The case study and control groups did not show any appreciable differences.

TABLE 2. Comparing hormonal instances (prolactin, L.H., and F.S.H.) with hormonal control.

	CASES AVAR± SDNO(164)	CONTROL AVAR± SD NO(100)
L.H I.U/L	16.25±4.o6	4.37±0.35
F.S,H I.U/L	8.74±1.43	5.33±0.44
Prolactin I.U/L	53.12±5.68	19.25±1.23

Furthermore, utilizing Pearson's correlation coefficient, the findings demonstrated no significant differences in the concentrations of the other research parameters (F.S.H. and Prolactin), and a positive significant link between age and L.H. (r= 0.478, p 000). table (3).

This study contradicts recent reports by Dabbous and Atkin (2018) that hyperprolactinemia causes excessively high quantities of adrenal steroids to be synthesized and secreted.[4] In study covering both male and female participants, hormonal imbalance—specifically, L.H., F.S.H., and Prolactin—is merely one potential contributing cause to infertility.

The levels of F.S.H. rise with age, whereas the levels of L.H. and Prolactin somewhat fall with age, as shown in table (3).

TABLE 3. Correlation between the studied infertility parameter for men and women.

Parameters N= 146	Parameter	r	P-value
	F.S.H. IU/L	0.46	0.12
Age	L.H. IU/L	0..478**	0.000
	Prolactin. IU/L	0.052	0.11

**** the correlation's significance level of 0.01.**

Prolactin is a protein hormone of the anterior pituitary gland that was originally named for its ability to promote lactation in response to the suckling stimulus of hungry young mammals. [15] Essentially, the pituitary gland is the primary source of almost all of the prolactin in normal individuals. A dditional pituitary and prolactin glands may also contribute significantly. However, they have different functions and mainly influence the surrounding environment by means of autocrine and paracrine processes [16]. This study disagrees with Langer, *et al*, (1991) study whose results were independent of prolactin (HPRL) levels or amenorrhea. [17-18].

The present study concludes that the findings contradict the claims made by Yu-lee (1997) and Bachelot (2007). They state that hyperprolactinemia is frequently linked to infertility in both males and females and it is caused by abnormal sexual and reproductive roles or agalactorrhea [19-20-21].

Data on falling fertility and infertile age indicate that pregnancy rates decrease gradually in the early 30s but significantly in the late 30s and early 40s [2].

3. CONCLUSTION

This is a conclusion, in order to determine the most likely investigative hormonal tests in the predictable work of infertility clinics, a thorough case-control study is carried out to estimate hormonal imbalance (L.H., F.S.H., and Prolactin) hormones in male and female infertility. The levels of hyperprolactinemia in the case study and control groups did not differ substantially from one another.

Additionally, using Pearson's correlation coefficient, the results showed a significant positive correlation between age and (L.H.), with no appreciable differences in the concentrations of the other parameters (F.S.H. and Prolactin) that were being studied.

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Arabic Abstract

هدف الدراسة: نحو دراسة تأثير هرمونات البرولاكتين و LH و FSH على العقم عند الذكور في منطقة النجف الأشرف.

الطرق: مائة وأربعة وستون من الرجال والنساء الأصحاء والخصبين كانوا بمثابة المجموعة الضابطة، في حين أن 184 رجلاً وامرأة يعانون من العقم من المسجلين جاءوا من مركز العقم ومدينة الصدر الطبية وآل. مدينة النجف. تتراوح أعمارهم بين 20 إلى 70 عامًا.

النتائج: وفقا للنتائج، كان متوسط LH ± st IU / L للمجموعة الضابطة 4.37 ± 0.35. كانت هناك اختلافات ملحوظة في .F.S.H.القيمة (8.74 ± 1.43 وحدة دولية / لتر).كان الانحراف المعياري 16.25 ± 4.6 وحدة دولية / لتر، في حين كانت القيمة لمجموعة التحكم 4.37 ± 0.35 وحدة دولية / لتر. شوهدت اختلافات كبيرة في .F.S.H.القيمة (8.74 ± 1.43 وحدة دولية / لتر) بين مجموعة المرضى الذين يعانون من العقم والمجموعة الضابطة (الرجال والنساء) (5.33 ± 0.44 وحدة دولية / لتر).،

كانت مستويات البرولاكتين في المرضى 53.12 ± 5.68 (وحدة دولية / لتر) و 19.25 ± 1.23 (وحدة دولية / لتر) في المجموعة الضابطة، على التوالي. لم يكن هناك فروق ذات دلالة إحصائية بين المجموعة الضابطة ودراسة الحالات، ولا المجموعة الضابطة أو دراسة الحالات.من ناحية أخرى، كانت مستويات البرولاكتين وهرمون .F.S.H.تنخفض بشكل طفيف مع التقدم في السن، بينما ترتفع مستويات .L.H

الخلاصة: تشير نتائج هذه الدراسة إلى أنه من أجل تصنيف مرضى العقم إلى مجموعات من الذكور والإناث وتقدير حالة شاملة وأبحاث مراقبة يجب إجراء أبحاث لكل من العقم عند الذكور والإناث بسبب عدم التوازن الهرموني .L.H، F.S.H، و. البرولاكتين.