



## THE STATISTICAL COMPARATIVE OF PROLACTIN HORMONE LEVEL BETWEEN NON – PREGNANT WOMEN AND MEN IN BAGHDAD/IRAQ

Noor Fouad M. Ali,

College of Health and Medical Techniques

Al- Bayan University, Baghdad, Iraq,

Email: noorfouad90@gmail.com

Qutaiba abd EL-Razaq Muner

Mashreq University, Baghdad, Iraq,

### Abstract

The pituitary gland produces the hormone known as (prolactin) that has huge function in lactation. In addition, it performs a variety of other important bodily tasks, including as controlling behavior, the immune system, and the reproductive system. The objectives of study were to measure the Biostatistical comparative of prolactin hormone between genders (non-pregnant women and men) in random aggregation of patients in Baghdad/Iraq.

This project provides a biostatistician examining of prolactin hormone in 100 patients separated equally in to two groups (50 men – 50 Non-pregnant Women), selected in age between (20-40 years) and the data took from different private laboratories in Baghdad/ Iraq through (2021 – 2022), then used of Ichroma TM PRL test on samples. The results appeared the prolactin hormone value in ( Low level: <5) of men was (8.00%) and its **lower** than non-pregnant women that was (12.00%), but in (Normal level: 5-25) the prolactin hormone value in men was (78.00%) that mean **higher** than non-pregnant women that was (52.00%), in other side in (High level: >25) the prolactin hormone value in men was (14.00%) **lower** than non-pregnant women that was (36.00%).

In summary, we concluded that Prolactin hormone levels are normally low for non-pregnant women and for men. There were a little elevation in prolactin hormone in men compared to non-pregnant women in (normal level) Because of the link between high prolactin levels and elevated body mass in men, not in non-pregnant women. The Prolactin hormone high levels are associated with a benign tumor of the pituitary gland known as prolactinoma (non-cancerous). However, if left untreated, these tumors can cause the demise of nearby tissues.

**Keywords:** Prolactin, Hormone, Statistical, comparative, genders, women, men.





## Introduction

Prolactin is composed of polypeptide hormone that is in charge of lactation, breast development, and many other processes essential for preserving homeostasis. Prolactin's chemical makeup resembles that of placental lactogen hormone and growth hormone. Collectively, they form the "prolactin/growth hormone/ placental lactogen" family, which is distinguished by a conserved helix bundle protein composition. This family of hormones shares a common ancestor gene. After proteolytic cleavage of the signal peptide from the prolactin prohormone (pre-prolactin) and post-translational modification, prolactin is made up of 199 amino acids. Although it is well known that the anterior pituitary produces and secretes prolactin and dopamine-mediated hypothalamic control, prolactin can also be produced by the immunological system, the uterus, the mammary glands, the central nervous system, and the endocrine system. Prolactin production in these tissues can be started by nipple stimulation, light, olfaction, and tension. Thyrotropin-releasing hormone (TRH), pregnancy-related estrogen, and dopamine antagonists are additional stimulants of prolactin synthesis (antipsychotics). Prolactin levels are often low in males. A pituitary adenoma or a drug side effect could be the cause of abnormal increase in males, which calls for further investigation. Males and non-pregnant females have low prolactin levels. [1, 2, 3, 4]

Hundreds of physiological processes are influenced by prolactin, but milk production and the growth of mammary glands within breast tissues are its two main roles. Mammary alveoli, which are part of the mammary gland and are where milk is really produced, expand more quickly as a result of prolactin's growth-promoting effects. Lactose (the milk carbohydrate), casein (the milk protein), and lipids are all produced by the breast alveolar epithelial cells when prolactin is present. The prolactin receptors are down-regulated on mammary glandular tissue during periods of elevated progesterone levels (i.e., during pregnancy). After delivery, the serum progesterone level drops, allowing for the up-regulation of prolactin receptors on the mammary alveolar cells, therefore enabling lactogenesis. Prolactin concentrations won't continue to be high even after delivery. Only when the nipples are stimulated can prolactin levels rise, allowing for regulation of milk production. Prolactin levels remain high as long as suckling is continued. When a mother is not nursing, her prolactin levels drop to a basic level, and her mammary glands produce less milk. After one to two weeks if the mother does not breastfeed her child, her prolactin levels return to pre-pregnancy levels. [5, 6, 7]





## Materials and Methods

The data of 100 patients were collected from different private laboratories in Baghdad/Iraq in duration between (September 2021- May 2022), in ages between (20-40 years old) and divided them in two groups (50 non- pregnant women & 50 men), all the data examined with prolactin (multi-mode) test by using (ichroma TM PRL).

## Statistical Analysis

To determine how various factors affected the study percentage, the Statistical Analysis System- SAS (2012) software was used. In this study, a significant comparison between percentages was made using the Chi-square test. [8].

## Results and Discussion

### Results:

The results of biostatistics values in 100 patients (50 men and 50 non-pregnant women) of prolactin hormone levels showed in (Table 1) and chart in (Figure 1) were explained horizontally and vertically as bellow:

### Vertically:

- In men the biostatistics percentages were (8.00%, 78.00%, 14.00%) for the groups (Low level: <5, normal level: 5-25, high level: >25) respectively, that indicated the P-value was (0.0001) with highly significant differences ( $P \leq 0.01$ ) of prolactin hormone levels for men.
- In non-pregnant women the biostatistics percentages were (12.00%, 52.00%, 36.00%) for the groups (Low level: <5, normal level: 5-25, high level: >25) respectively, that indicated the P-value was (0.0004) with highly significant differences ( $P \leq 0.01$ ) of prolactin hormone levels for non-pregnant women.

### Horizontally:

- The P-value in group of (Low level: < 5) of prolactin hormone for men and non-pregnant women was (0.382) that results of non-significant differences (NS) between the two genders.
- But the P-value in group of (Normal level: 5-25) of prolactin hormone for men and non-pregnant women was (0.0073) that results of highly significant differences ( $P \leq 0.01$ ) between the two genders.
- And the same thing in P-value in group of (High level: >25) of prolactin hormone for men and non-pregnant women was (0.0087) that results of highly significant differences ( $P \leq 0.01$ ) between the two genders.

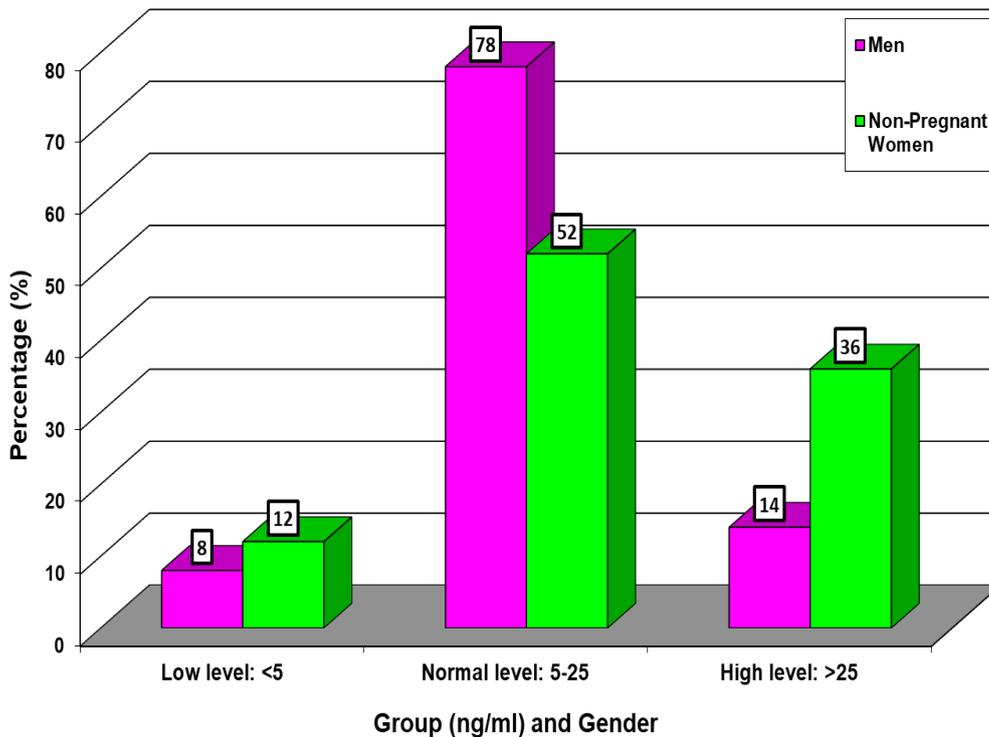


Table (1): Biostatistics values of Prolactin level in men and non-pregnant women.

Prolactin range in serum blood (ng/ml)	Men No. (%)	Non-pregnant Women No. (%)	P-value
Low level: <5	4 (8.00%)	6 (12.00%)	0.382 NS
Normal level: 5-25	39 (78.00%)	26 (52.00%)	0.0073 **
High level: >25	7 (14.00%)	18 (36.00%)	0.0087 **
Total No = 100	50	50	--
P-value	0.0001 **	0.0004 **	--

\*\* (P≤0.01).

**Lastly**, The prolactin hormone value in ( Low level: <5) of men was (8.00%) and its **lower** than non-pregnant women that was (12.00%), but in (Normal level: 5-25) the prolactin hormone value in men was (78.00%) that mean **higher** than non-pregnant women that was (52.00%), in other side in (High level: >25) the prolactin hormone value in men was (14.00%) **lower** than non-pregnant women that was (36.00%) as appear in chart (**Figure 1**)



**Figure (1): Biostatistics values of Prolactin level in men and non-pregnant women.**



### **Discussion:**

The prolactin hormone value of ( Low level:  $<5$ ) in men was (8.00%) lower than non-pregnant women that was (12.00%), because the Prolactin hormone levels are normally low for non-pregnant women and for men, and this project was approved with Al-Chalabi, M., Bass, A. N., & Alsalman, I. (2018).[9]

But in other wise, The prolactin hormone value of (Normal level: 5-25) in men was (78.00%) higher than non-pregnant women that was (52.00%), and Studies indicate a slight rise in prolactin hormone in males compared to non-pregnant women because high prolactin levels are associated with increasing body mass in men, not in women. This study was confirmed by Greenman, Y., Tordjman, K., & Stern, N. (1998). [10]

Finally, The prolactin hormone value of (High level:  $>25$ ) in men was (14.00%) lower than non-pregnant women that was (36.00%) but both of them are high values, that could be referring to a specific form of pituitary tumor known as (prolactinoma), The gland releases excessively prolactin as a result of this tumor. Men and women who are not nursing or pregnant can produce breast milk when their prolactin levels are excessive. Menstrual irregularities and infertility can also result from excessive prolactin in women. Erectile dysfunction (ED), which is the inability to obtain or sustain an erection, can cause men to have less desire for sex. Most prolactinomas are benign (non-cancerous). However, if neglected, these tumors can harm nearby tissues, and all that agreed by Verhelst, J., & Abs, R. (2003). [11]

### **Conclusion:**

We concluded that Prolactin hormone levels are normally low for non-pregnant women and for men. There were a little elevation in prolactin hormone in men compared to non-pregnant women in (normal level) Because of the link between high prolactin levels and elevated body mass in men, not in non-pregnant women. The Prolactin hormone high levels are associated with a benign tumor of the pituitary gland known as prolactinoma (non-cancerous). However, if left untreated, these tumors can cause the demise of nearby tissues.

### **Recommendation:**

It would be helpful to involved many countries with Iraq or many provinces of Iraq (north-middle-south) and compare it with each other by prolactin hormone examination. We Recommended to focus on seasonal changes (winter-summer-spring-autumn) and their impression on prolactin hormone. And lastly, we suggested to measure between prolactin hormone and TSH hormone in men and women in Iraq.





### References:

1. Jin Y, Fan M. Treatment of gynecomastia with prednisone: case report and literature review. *J Int Med Res.* 2019 May;47(5):2288-2295.
2. Li H, Huang Y, Li Y, Zheng B, Cui J, Liu M. Endocrine Manifestations in POEMS Syndrome: a case report and literature review. *BMC Endocr Disord.* 2019 Mar 22;19(1):33.
3. Bernard V, Young J, Binart N. Prolactin - a pleiotropic factor in health and disease. *Nat Rev Endocrinol.* 2019 Jun;15(6):356-365.
4. Vilar L, Vilar CF, Lyra R, Freitas MDC. Pitfalls in the Diagnostic Evaluation of Hyperprolactinemia. *Neuroendocrinology.* 2019;109(1):7-19.
5. Freeman ME, Kanyicska B, Lerant A, Nagy G. Prolactin: structure, function, and regulation of secretion. *Physiol Rev.* 2000 Oct;80(4):1523-631.
6. Raut S, Deshpande S, Balasinor NH. Unveiling the Role of Prolactin and its Receptor in Male Reproduction. *Horm Metab Res.* 2019 Apr;51(4):215-219.
7. Abramicheva, P.A. and Smirnova, O.V. (2019). Prolactin receptor isoforms as the basis of tissue-specific action of prolactin in the norm and pathology. *Biochemistry* 84: 329–345
8. SAS. 2018. Statistical Analysis System, User's Guide. Statistical. Version 9.6th ed. SAS. Inst. Inc. Cary. N.C. USA.
9. Al-Chalabi, M., Bass, A. N., & Als Salman, I. (2018). Physiology, prolactin. 40
10. Greenman, Y., Tordjman, K., & Stern, N. (1998). Increased body weight associated with prolactin secreting pituitary adenomas: weight loss with normalization of prolactin levels. *Clinical endocrinology*, 48(5), 547-553.
11. Verhelst, J., & Abs, R. (2003). Hyperprolactinemia. *Treatments in Endocrinology*, 2(1), 23-32.

