**Hormonal and Bıochemıcal Study of the Effect of**

**Vitamin D on Polycystic Ovaries in Women**

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| --- |
| **Abstract**  Polycystic ovary syndrome (PCOS) is a shared reason for ovarian dysfunction in women with anovulation. The main symptoms are branded by chronic anovulation, hyperandrogenism, and/or the presence of ovarian cysts on ultrasound examination. Low levels of vitamin d3 exacerbate PCOS symptoms, including insulin resistance, ovulation, menstrual irregularities, infertility, hyperandrogenism, and obesity, and increase the risk of cardiovascular disease. In this study, we will try to find a relationship between PCOS and vitamin D deficiency in affected women. The study included (120) samples distributed into two groups, the patient’s group consisted of (80) samples and the control group consisted of (40) samples. Some chemical and hormonal tests were done such as Vit D3, TT, PRL, FSH, LH, TG, CHO, HDL, LDL, VLDL. We found low levels of Vitamin D, Follicle-Stimulating hormone, Cholesterol levle, High-density Lipoprotein (HDL) level, and Low-density Lipoprotein (LDL) level. Also, we found high levels of Testosterone level, Prolactin level, Luteinizing hormone level, Triglyceride level, and Very Low-density Lipoprotein (VLDL) level.  **Keywords:** *Polycystic ovary syndrome, Vitamin D, Testosterone hormone, Prolactin hormone, LH* |
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1. **Introduction**

Polycystic ovary syndrome (PCOS) is the most commonplace endocrine complaint amongst ladies of generative age. It is a multifactorial sickness branded by way of the living of hyperandrogenism with ovulatory dysfunction [1]. PCOS influences about 5-10% of ladies of childbearing age [2]. It is the maximum not unusual motive of infertility because of anovulation. Metabolic disorders are commonplace in co-taking place ladies, having insulin resistance, weight problems, type 2 diabetes mellitus, dyslipidemia, metabolic syndrome, high blood pressure, cardiovascular disease, and while menstrual disease is considered [3].

a hormonal imbalance reasons too many follicles (small fluid-stuffed sacs in which eggs develop) on the ovaries. These numerous follicles appear to be cysts, that's where the term “polycystic” originates from [4]. In polycystic ovaries, the ovaries are large than ordinary. That PCOS is a disorder related to the whole frame, not just the ovaries, proof that a problematic or dysfunction in unique area reasons dysfunction in other regions due to the fact the body is a unified entire [5].

The affiliation of PCOS and endometriosis changed into first pronounced in 1949, and the complex overlap among endometrial cancer and PCOS [6]. Women with PCOS percentage several threat factors associated with the improvement of endometrial cancer along with peculiar uterine bleeding [7]. A hormonal imbalance reasons too many follicles (small fluid-stuffed sacs in which eggs develop) on the ovaries. These numerous follicles appear to be cysts, that's where the term “polycystic” originates from [4].

Vitamin D can also play a first-rate role in the development of PCOS. There has been a focal point on diet D supplementation as an accessory in PCOS [8]. Several studies have said low nutrition D degrees in ladies with PCOS, with regular vitamin D ranges amid 11 and 31 ng/ml, with values as low as 20 ng/ml (67-85) [9].

Giving vitamin D to ladies with PCOS has a helpful influence on markers of systemic irritation and oxidative harm. Certain studies have designated that nutrition D lack is a hassle in sufferers with PCOS, despite the fact that consequences of randomized trials assessing the result of nutrition D supplementation on metabolic outlines amongst women with PCOS are contradictory [10]. Vitamin D deficiency is also related to expanded tiers of overall testosterone and dehydroepiandrosterone sulfate (DHEAS) in PCOS patients [11].

1. **Materials and Methods**

Specialized hormonal materials and reagents applied, Specialized biochemical materials and reagents are illustrated in Table 1.

**Table 1.** The subject name and the manufacturing company

|  |  |
| --- | --- |
| Subject Name | The manufacture company |
| Testosterone test kit | Korea / boditech |
| Prolactin test kit | Korea / boditech |
| FSH test kit | Korea / boditech |
| LH test kit | Korea / boditech |
| Vitamin D | Korea / boditech |
| Cholesterol | Spain / Linear |
| Triglyceride | Spain / Linear |
| HDL | Germany **/** Human |

**4. Results and Discussion**

* 1. **Vitamin D**

Vitamin D level in subjects showed least level in patients pcos followed by then the higher level in control, it is illustrated in Table 2.

**Table 2.** Vitamin D level difference among the studied group

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | | **Mean** | **SE** | **SD** |
| VITAMIN D | Control | 38.55 | 0.72 | 4.57 |
|  | PCOS | 22.25 | 1.18 | 10.62 |
|  | P-value | 1.06NS | | |
| NS: None statistically significant variance (p>0.05). | | | | |

## Testosterone

Testosterone hormone levels in subjects showed higher levels in patients PCOS followed by then the least level in control, it is illustrated in Table 3.

**Table 3.** Testosterone hormone level difference among the studied group

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | | **Mean** | **SE** | **SD** |
| Testosterone (ng/mL) | Control | 0.7 | 0.02 | 0.14 |
|  | pcos | 1.34 | 0.065 | 0.58 |
|  | p-value | 8.18NS | | |
| NS: None statistical significant variance (p>0.05). | | | | |

## Prolactin

Prolactin hormone level in subjects showed higher level in patients PCOS followed by then the least level in control, it is illustrated in Table 4.

**Table 4.** Prolactin hormone level difference among the studied group

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | | **Mean** | **SE** | **SD** |
| Prolactin (ng/mL) |  | 17.4 | 0.7 | 4.47 |
|  | pcos | 31.13 | 1.52 | 13.6 |
|  | p-value | 9.79NS | | |
| NS: None statistical significant variance (p>0.05). | | | | |

## Luteinizing Hormone

Luteinizing hormone level in subjects showed higher level in patients PCOS followed by then the least level in control, it is illustrated in Table 5.

**Table 5.** Luteinizing Hormone level differences among the studied group

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | | **Mean** | **SE** | **SD** |
| Luteinizing hormone(mIU/ml ) | Control | 10.07 | 0.52 | 3.3 |
|  | pcos | 14.87 | 0.61 | 5.53 |
|  | p value | 1.61NS | | |
| NS: None statistical significant variance (p>0.05). | | | | |

## Follicle-Stimulating Hormone

Follicle-Stimulating hormone levels in subjects showed the least level in patients PCOS followed by then the higher level in control, it is illustrated in Table 6.

**Table 6.** Follicle-Stimulating Hormone level difference among the studied group

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | | **Mean** | **SE** | **SD** |
| Follicle-Stimulating Hormone(mIU/ml ) | Control | 6.28 | 0.32 | 2.06 |
|  | pcos | 4.56 | 0.23 | 2.13 |
|  | p value | 0.00005\*\* | | |
| \*\*: High statistical significant variance (p≤0.05). | | | | |

## Cholesterol

Cholesterol levels in subjects showed the least level in patients PCOS followed by then the higher level in control, it is illustrated in Table 7.

**Table 7.** Cholesterol level difference among the studied group

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Variable | | **Mean** | **SE** | **SD** |
| CHO (mg/dl) | Control | 170.075 | 2.44 | 15.46 |
| pcos | 133.225 | 2.72 | 24.34 |
| p value | 2.04NS | | |
| NS: None statistical significant variance (p>0.05). | | | | |

**Acknowledgment**

In this study, the financial support was provided by the Author. All experimental works were conducted in Diyala Hospital Laboratory. The author would like to thanks to all supporters due to their precious contributions.

I would like to express my thanks to my advisor, Prof. Dr. Hakan ÇOLAK, for his support, guidance, and understanding. And the second supervisor, Dr. Ahmed sulaiman JUMAAH for his guidance and assistance. and Dr. Huseen for his support and always being available to help. Also, I'd want to express my heartfelt gratitude to my father and mother for their unwavering support throughout my academic career.

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