The Correlation of Chemerin Hormone with Polycystic Ovary Syndrome in Women at Samarra City, Iraq

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ABSTRACT

The study was conducted on 70 samples out of which, 40 samples were infected with polycystic ovary syndrome and 30 samples were from healthy women (control group) and their ages ranged between (18–35) years and the samples were collected from external medical laboratories of radiology and ultrasound units in Samarra city. After that blood was collected from sample study and separated by centrifugation. The biochemical parameters were estimation, including (chemerin, total cholesterol (TC), triglyceride (TG), high-density lipoprotein (HDL), low-density lipoproteins (LDL), very low-density lipoproteins (VLDL)) and it was relied on ultrasound and hormone analyzes The nationality of the patient for the purpose of diagnosis and confirmation of PCOS.

The results of the current research showed that there was a significant increase in the levels of Chemerin and T.G, LDL, VLDL in the blood serum of people infected with PCOS compared to healthy Women, and the results also showed a significant decrease in the level of HDL in the blood serum of Women with the PCOS compared to healthy people.

Keywords: Chemerin, Lipid profile, PCOS.

INTRODUCTION

Polycystic ovary syndrome is defined as a heterogeneous endocrine disorder and is one of the most common causes of anovulatory and endocrine infertility affecting women.[1] It was found that it affects 6–10% of women all over the world.[2] PCOS-affects various metabolic processes in a woman's body and thus causes many hormonal disorders, including an increase in the levels of luteinizing hormone as a result of increased sensitivity of the pituitary gland to gonadotropin-releasing hormone, and this leads to an increase in the concentration of GnRH or to changes in its secretion patterns.[3] In addition, it was found that there was an increase in the levels of the hormone prolactin,[4] and testosterone is one of the steroid hormones, and that its high levels are one of the causes of polycystic ovary syndrome.[5] In addition, it was found that women with (PCOS) suffer from: An imbalance in the level of fats in the blood, including high cholesterol, triglycerides-(T.G), low-density lipoprotein (LDL) and low high-density lipoprotein (HDL), and the percentage of fat varies from one patient to another depending on body weight and diet and sweat.[6]

Chemerin is one of adipokines consists of 163 amino acid and is activated by the serine protease enzyme to form the active chemerin,[7] discovered in 1997 as a gene and recognized in 2007,[8] identified For the first time in pre-psoriasis dermatologists.[9] The chemerin hormone plays a prominent role in many diseases and its association with cardiovascular diseases. Transcripts of chemerin receptors were found primarily in the spleen, placenta, lymph glands, pituitary gland, liver, as well as in the synovial fluid pool of arthritis patients. However, it was not expressed in White blood cells- WBC in the blood,[10] and an elevated chemerin level was found to be associated with several inflammatory conditions including ulcerative colitis, hepatitis, and polycystic ovary syndrome.[11] It was found[12] that there is a correlation between chemerin levels and polycystic ovary syndrome.

Through the relationship of adipokines with polycystic ovary syndrome, the current research aimed to assess the level of chemerin hormone with lipid indicators in the blood serum of women with polycystic ovary syndrome.

SUBJECT AND METHOD

Sample Collection and Study Design

The study was conducted on 70 blood samples,40 samples for patients with PCOS, and 30 sample of healthy individuals as a control group, the age range (18–35) year. Patient samples were collected from Samarra General Hospital. The serum samples were obtained from the collected blood after centrifugation

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and used for determination of the biochemical parameters under investigation.

Methods

The present study include estimation of:

- The serum chemerin level was determined by ELISA using shanghai chemerin measurement kit and Bio kit ELISA system.
- Serum lipid profile was also determined by the present study Total cholesterol by Allain method,[13] T.G by Fossati method,[14] HDL level according to Gotto method,[15] and low-density lipoprotein –LDL and very low-density lipoprotein according to Friedwald method.[16]

STATISTICAL ANALYSIS

The SPSS statistical program was used and the rate and standard deviation of the rate were determined, as well as the averages for all groups were determined using the F-Test and at a probability level p≥0.01.

RESULT AND DISSECTION

Estimation of Serum Chemerin Hormone Level

Table 1 shows the mean ± S.D of the chemerin hormone level in the blood serum. The results showed a significant increase in the chemerin hormone level in Sera blood of women with PCOS compared to healthy women, as shown in Figure 1.

The results agreed with other research,[17,18] which showed in their study a significant increase in the level of chemrin in overweight patients with PCOS compared to normal weight. On the other hand, the results do not agree with other research.[19] which indicated in his study that there are no significant differences between chemerin levels in patients with PCOS compared to healthy women.

Polycystic ovary syndrome is probably the most common endocrine disorder affecting females and is the most common cause of menstrual irregularities during childbearing age. and obesity.[20] It has been pointed out that body mass index is not the only predictive factor for circulating chemrin, as studies have reported that in PCOS, there is a positive association between chemrin and Body mass index (BMI) and triglycerides, also found inverse association between chemerin and HDL.[21] In fact, an association between adipokines and PCOS has been repeatedly reported. Also, some Studies have found increase chemerin hormone in women with PCOS and the same results were recently found by Wang in the non-obese women group.[22]

Estimation of Serum Cholesterol Level

Table 1 shows the mean ± S.D of cholesterol level in serum blood, as it showed that were no significant differences in serum blood in women with PCOS compared to healthy women, as shown in Figure 2.

The results agreed with other findings,[23,24] which indicated no significant differences in cholesterol levels in the serum blood of women with polycystic ovary syndrome compared to Control women, on other hand other study says[25] that was increase in Cholesterol level in the blood serum of patients with PCOS.

Estimation of Serum Triglycerides Levels

Table 1 shows mean ± S.D of triglycerides level in sera. The results showed a significant increase in level T.G in Sera of women with PCOS compared to healthy women, as shown in Figure 3.

Estimation of Serum HDL Levels

Table 1 shows mean ± S.D of the level of HDL in the blood Sera. The results showed a significant Low in the level of HDL in the blood Sera of women with PCOS compared to healthy women, as shown in Figure 4.

Estimation of Serum LDL Levels

Table 1 shows the mean ± S.D of the level of Low-density lipoprotein in the blood serum. The results showed a significant High in the level of LDL in Sera of women with PCOS compared to healthy women, as shown in Figure 5.
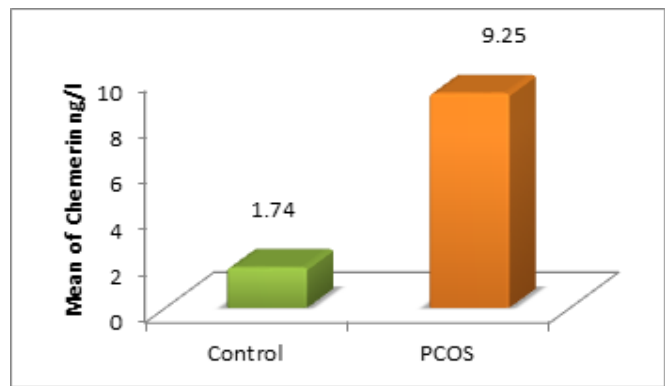

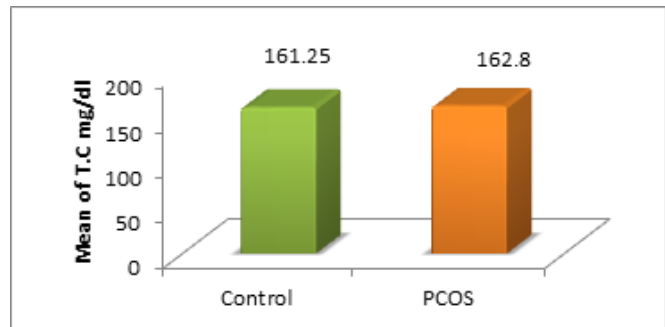**Figure 1:** Concentration of serum Chemerin in groups under investigation

Figure 2: Concentration of serum T.C in groups under investigation

Table 1: The mean ± S.D of chemerin hormone and lipid Profile levels in the Sera of the study groups

P≤	PCOS women	Healthy women	Biochemical
**	±0.7749.250	±0.2661.740	(Chemerin) ng/L
NS	162.80 ± 13.0	161.25 ± 9.96	(Cholesterol) mg/dL
**	80.42 ± 2.59	18.36 ± 1.54	(T.G) mg/dL
**	10.90 ± 1.90	27.87 ± 1.97	(HDL) mg/dL
**	158.80 ± 2.13	114.10 ± 5.47	(LDL) mg/dL
**	78.18 ± 2.64	49.52 ± 3.97	(VLDL) mg/dL

Mean± S.D

Significant p ≤0.01 **
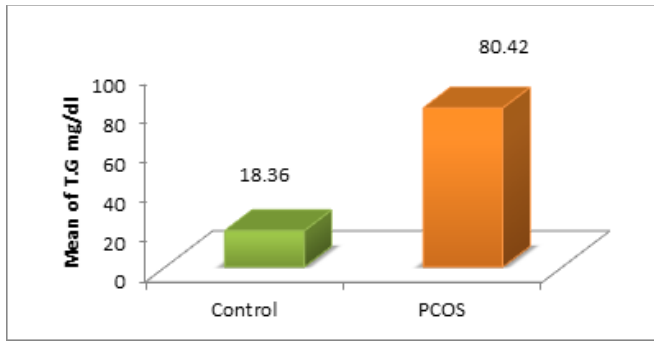N: The number of people in each group

Figure 3: Concentration of serum T.G in groups under investigation
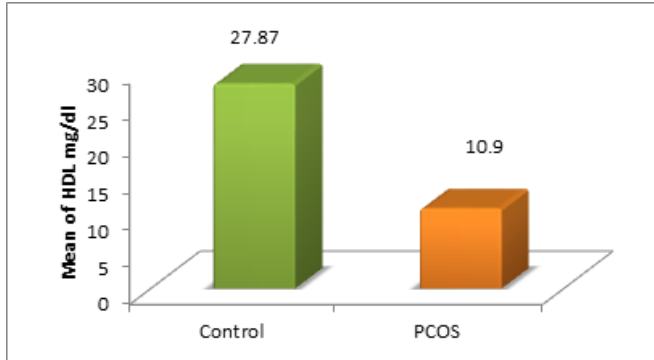

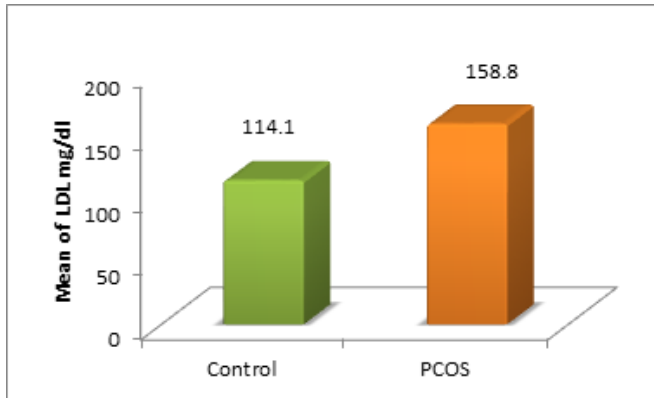**Figure 4:** Concentration of serum HDL in groups under investigation

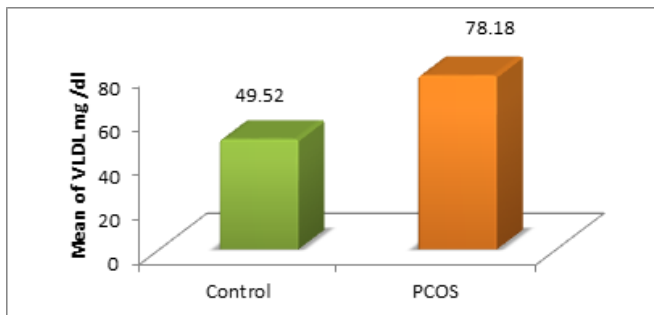**Figure 5:** Concentration of serum LDL in groups under investigation

Figure 6: Concentration of serum VLDL in groups under investigation

Estimation of Serum VLDL levels

Table 1 shows mean ± S.D of level of Very Low-density lipoprotein in the blood serum. The results showed a significant High in level of VLDL in Sera of women with PCOS compared to healthy women, as shown in Figure 6.

In the present study, dyslipidemia has been found in PCOS patient Robinson *et al.* and Jayrasree[26,27] showed the lipid profile in PCOS women for study for example; there were High in TG and LDL level and Low HDL level which is similar to this study. These results are in agreement with other results.[25,28] Also, Jayasekara[29] showed that in PCOS, there were statistically significant increases in serum LDL and triglycerides relative to the matched control group, while serum HDL was lower in PCOS than control group. Also in PCOS, there were statistically significant increases in serum LDL, T.G, VLDL while serum HDL was lower in PCOS than healthy group.

PSOS- is one of the important endocrine disorders causing reproductive abnormalities in women,[30] Dyslipidemia is one of the important risk factors associated with PCOS. In our study we have observed, there is alteration in serum lipid profile. There is significant High in serum T.G, serum cholesterol, serum LDL-C, serum VLDL-C and Low in the levels of serum HDL-C levels.

Hypertriglyceridemia leads through the reverse cholesterol transfer pathway to reduced HDL cholesterol and elevated LDL cholesterol levels. The further androgenic priming of adipocytes in early life predisposes PCOS-associated blood lipid disorder.[31]

Lipid disorders have been associated with insulin resistance.[32] The cause of high triglycerides is attributed to their accumulation, which may occur as a result of increased fat accumulation in the body, or a decrease in fatty acid oxidation. As the increased secretion of VLDL-C in the liver leads to high triglycerides. It occurs as a result of insulin resistance, which appears in PCOS patient.[33] Finally, she indicated in her study that there is a weak positive correlation between chemerin and T.C levels, which means that the cholesterol level has slightly increased with the rise in hormone levels. It also found a positive correlation between the levels of chemerin and triglycerides, which means that the level of fat has increased with the increase in the hormone. Also found a neactive association between chemerin and LDL.[34,35]

CONCLUSIONS

The results of the Study research conclude the following: -
- a significant increase in Chemerin hormone level in Sera of Women with PCOS compared to healthy people.
- a significant increase in T.G, LDL, VLDL level and decrease in HDL level in sera of Women with PCOS compared to healthy people. but no significant of Cholesterol in all groups.

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