Correlation of Chemerin with Lipid Profile in Blood Women Polycystic Ovarian Syndrome in Tikrit City

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Abstract

Background: Polycystic ovary syndrome (PCOS) is the most common endocrine disorder in women of reproductive age, affecting 6%–10% of women worldwide. Objective: The study aimed to assess the relation of serum chemerin level with lipid profile in women with polycystic ovarian syndrome.

Materials and Method: A cross-sectional study was carried out in Salah Al-din City from 10th of October 2019, to 20th of December 2019. The number of polycystic ovary syndrome women under study was 60 women whose ages were between 15 and 36 years old. These women admitted to obstetrics and gynecology unit at Salah Al-din Teaching Hospital. The control group who were matched to the patients studied included 30 women.

Results: The study showed that there is the significant difference between PCOS women and the control group concerning serum chemerin level and lipid profile in PCOS women. This study demonstrates that there was a weak positive correlation between levels of chemerin and cholesterol in PCOS women (r = 0.02) which is mean that cholesterol level is slightly increased with the elevation of chemerin hormone in women with PCOS, There was a positive correlation between levels of chemerin and Triglyceride in PCOS women (r = 0.16) which is mean that level is slightly Triglyceride increased with the elevation of chemerin hormone in women with PCOS, There was a positive correlation between serum levels of chemerin and VLDL in PCOS women, slightly VLDL increased with the elevation of chemerin hormone in women with PCOS. There was a positive correlation between levels of chemerin and LDL in PCOS women, slightly LDL increased with elevation of chemerin hormone in women with PCOS. This study showed negative correlation between Chemerin and, HDL in PCOS women, slightly HDL decreased with the elevation of chemerin hormone in women with PCOS.

Conclusion: Highly significant relation of Chemerin and Cholesterol,Triglyceride,LDLandVLDL in PCOS,While negative correlation between Chemerin and HDL.

Keywords: *Polycystic ovary syndrom, Chemerin, Cholesterol, Triglyceride, HDL,VLD and LDL.*

Introduction

Polycystic ovary syndrome is the most common endocrine disorder in women of reproductive age, affecting 6%–10% of women worldwide.(1) Polycystic ovary syndrome is characterized by chronic anovulation, hyperandrogenism, and multiple small subscapular cystic follicles in the ovary on ultrasonography.(2)

Chemerin is a new adipokine of 163 amino acids and a of a molecular weight of 14 kDa(3) Chemerin has been identified as a novel discovered adipocytokine that has been shown to regulate adipocyte differentiation, modulation the expression of adipocyte genes.(4) Chemerin is found to be highly expressed in adipose tissue and the liver, as well as by cells of the innate immune system, where it modulates the function of innate immune cells. These adipokines are thought to be involved in the development of metabolic syndrome and its related diseases including obesity, T2DM and cardiovascular disease.(5) Additionally, chemerin levels have been shown to be high in obese PCOS women with insulin resistance.(6)

Materials and Method

A cross-sectional study was carried out in Tikrit City from 10th of October 2019 to 20th of December 2019. The number of PCOS women under study was 60 women whose ages were between 15 and 36 years. The diagnosis of PCOS was based on Rotterdam Criteria: oligo and/or anovulation clinical and/or biochemical signs of hyperandrogenism, and polycystic ovaries in ultrasound, meaning presence of 12 or more follicles measuring 2 – 9 mm in diameter in each ovary and/or ovarian volume more than 10 cm^3. In addition the control group consisted of 30 apparently healthy volunteer females with regular menstrual cycles aged between 15 and 36years. A volume of 5 mls of blood sample was taken by vein puncture from each subject enrolled in this study. Blood samples were placed into sterile test tubes, after blood clotting, the samples were centrifuged at 3000 rpm for 15 min then if a clot was developed, then was removed and re-centrifuged at 3000 for 10 min, and the obtained serum were aspirated using mechanical micropipette and transferred into clean plain tubes with screw which labeled and stored in deep freeze at - 20 °C for the biochemical measurement of amylin by ELIZA.

Statistical Analysis: The statistical analysis was performed using Statistical Package for the Social Sciences version 23 (SPSS, IBM Company, Chicago, USA).

Results

This study showed that there was a positive correlations between serum levels of chemerin and chol esterol,Triglyceride,VLDL,and LDL as shown in figures (1) (2) (3) (4), while negative correlations between serum levels of chemerin and HDL in PCOS women as shown in figure 5

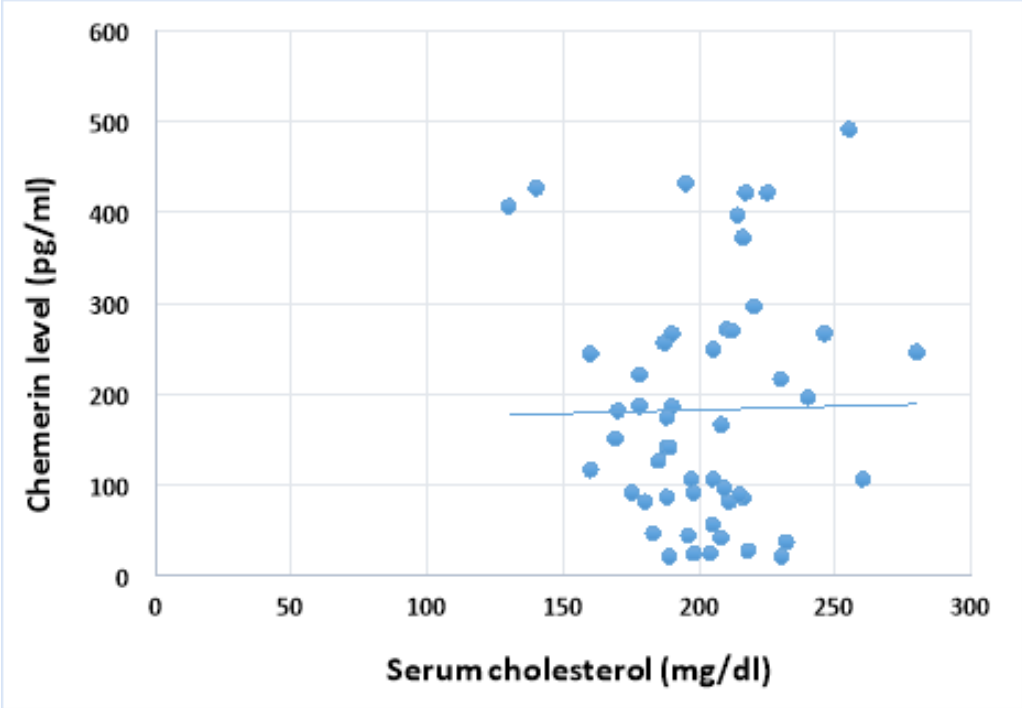

Figure 1: Correlation between levels of Chemerin and Cholesterol in PCOS women.

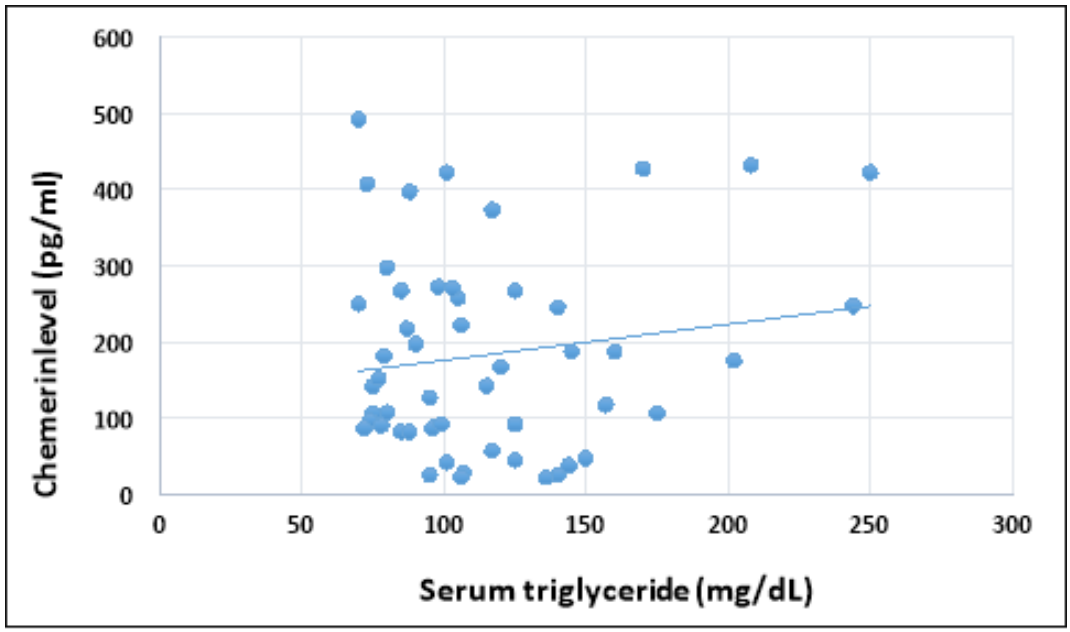

Figure 2: Correlation between levels of Chemerin and triglyceride in PCOS women.

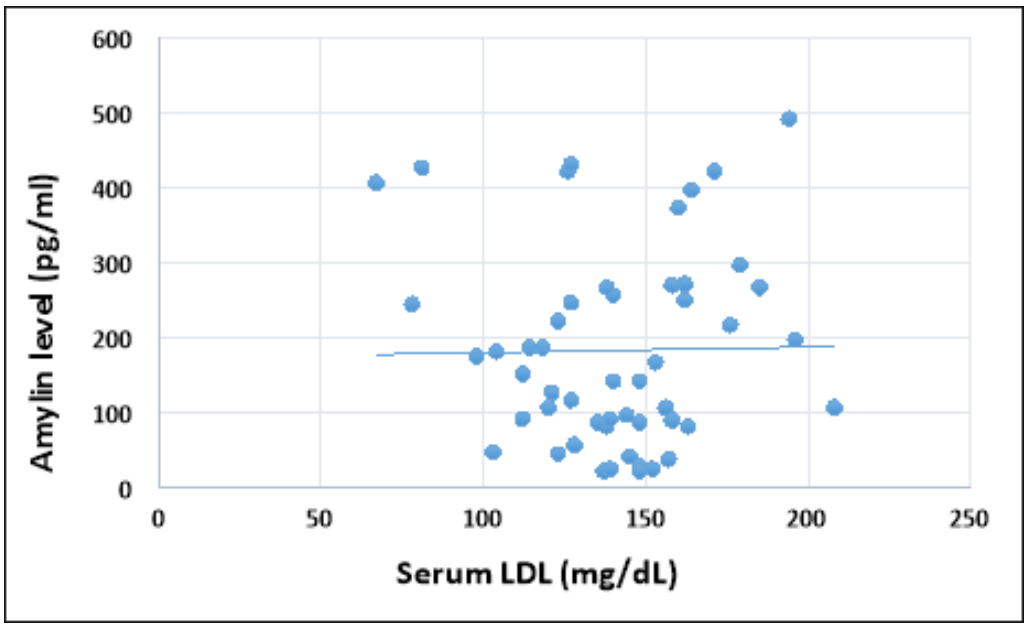

Figure 3: Correlation between levels of Chemerin and S. LDL in PCOS women.

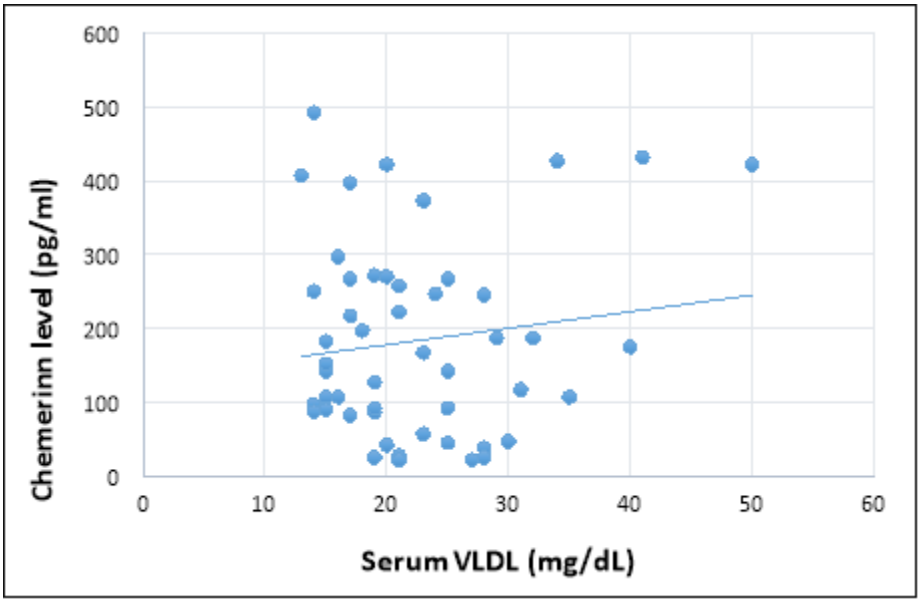

Figure 4: Correlation between levels of Chemerin and S. VLDL in PCOS women

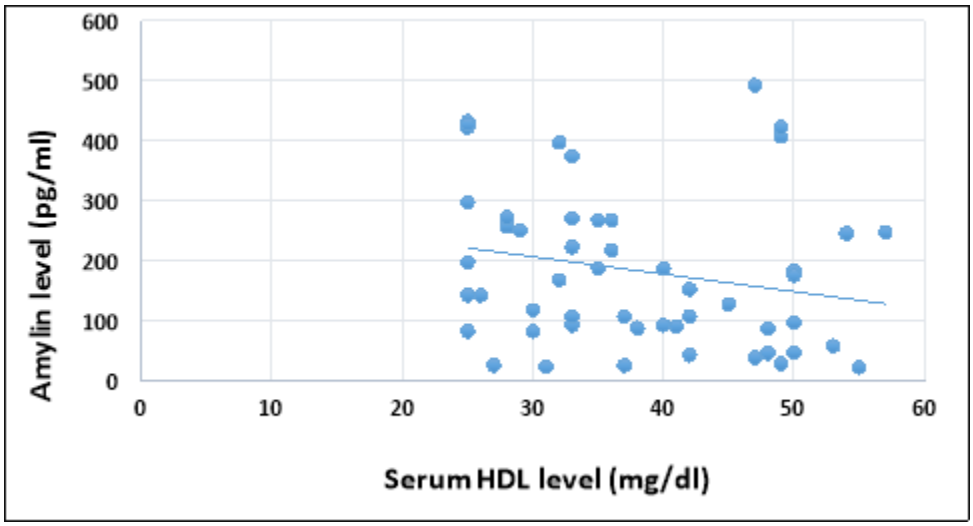

Figure 5: Correlation between levels of Chemerin and HDL in PCOS women

Discussion

Polycystic ovary syndrome (PCOS), is a disorder characterized by heterogeneous clinical presentations including hyperandrogenism, menstrual irregularity, and infertility along with metabolic disturbances manifested by hyperinsulinemia, obesity, hypertension, and dyslipidemia.[7] This study showed that there was a positive correlations between serum levels of chemerin and cholesterol,Triglyceride,VLDL,and LDL as shown in figures (1) (2) (3) (4), while negative correlations between serum levels of chemerin and HDL in PCOS women as shown in figure 5. Both visceral fat and insulin resistance are significant determinants for an impaired lipid metabolism.[8] PCOS women are exposed to increased risk for cardiovascular diseases (CVD) through early progression of atherosclerosis and dyslipidemia is an important factor, thus a recent recommendation has been proposed for PCOS women, to assess their lipoprotein lipid profile, in an attempt to prevent CVD.[9] Our data confirms previous reports stating that PCOS women display increased total cholesterol, LDL cholesterol and triglycerides, and low HDL cholesterol, pattern that is usually linked to insulin resistance.[10] Hypertriglyceridemia and low HDL-C are common metabolic abnormalities found in women with PCOS.[11] A study by Aye *et al*. suggested that

the presence of hypertriglyceridemia could contribute to atherothrombosis via platelet hyperactivation in PCOS.[12] Chemerin serum levels in this present study were also positively correlated with TG and VLDL in the MetS group. This co-relation was proved also by Bozaoglu *et al.*(13) study that was conducted in a large cohort and showed that serum TG was correlated with serum chemerin.Ye *et al* [14] Regarding the association of chemerin with HDL-C level, the present study showed that serum chemerin where nagetively correlated with HDL-C levels. These results were in agreement with Er *et al*. found that chemerin levels were negatively correlated with HDL-C plasma levels in Metabolic syndrome. (15) Although obesity is often associated with metabolic disorders, lean women with PCOS also were found to have hyperinsulinemia and dyslipidemia.[16]

Hussain found that there were high levels of TG, Cholesterol, and LDL in combination with low level of HDL and with an increase in atherogenic index in women with PCOS.[17] These data are consistent with prior studies of dyslipidemia in women with PCOS.[18] Most studies of dyslipidemia and PCOS have reported on cholesterol levels and TG, the lipid profile that is found in women with PCOS consists of elevated TG levels together with low levels of HDL.[19] Increased secretion of VLDL particles by the liver results in elevated plasma TG concentrations. Subsequently, TG is exchanged for cholesteryl ester by the activity of cholesteryl ester transfer protein. Lipid metabolism in women with PCOS may also be affected by ovarian and-or adrenal secretion of sex-steroid. The effects of sex-steroids on lipid metabolism are complex and involve the actions of both androgens and estrogens. Hyperandrogenism has been associated with increased hepatic lipase (HL) activity. This enzyme, that has a role in the catabolism of HDL particles (partially responsible for the hepatic removal of the HDL particles) exhibits strong dimorphism with exogenous androgens up regulating, and estrogens down-regulating its activity.[20]

Conflict of Interest: None

Source of Findings: None

Ethical Clearance: None

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