

Study of some biochemical variations in women used the steroidal contraceptive type

Saria Naji Muhsin Al-dury

College of Sciences, Tikrit University, Tikrit, Iraq

DOI: <http://dx.doi.org/10.25130/tjps.23.2018.024>

ARTICLE INFO.

Article history:

-Received: 24 / 10 / 2017

-Accepted: 27 / 11 / 2017

-Available online: / / 2018

Keywords: Steroidal ,
Contraceptive.

Corresponding Author:

Name:

Saria Naji Muhsin Al-dury

E-mail:

Saria7052@gmail.com

Tel:

Affiliation:

Abstract

This study included (100) samples of women used Steroidal Contraceptive types in (Samarra General Hospital) (20) blood samples pulled from healthy women as Control sample. The samples were distributed into three groups; the first group:- (40) women used a combined oral contraceptive the second group:- (40) women used Combined injectable contraceptive. The third group:- (20) was the women not used contraceptive (control). The results of the study indicated high significant decrease in the Concentration of the Uric acid ($P < 0.001$) and a high increment in the Concentration of the creatinine at level ($P < 0.001$) in approach to the control group. The results revealed high significant decrease in the proteins of the blood (Total protein, Albumin) ($P < 0.001$) when compared to control cluster. while the results showed a rise in the concentration of Cholesterol, Triglyceride, LDL ($P < 0.001$) effective decrease in the HDL when compared to the control group.

Introduction

Steroid hormones are a group of hormones, They are secreted by the adrenal cortex, ovaries, and by the placenta. All steroid hormones are derived from cholesterol. They are transported through the bloodstream to the cells of various target organs [1].

The oral contraceptive pill, also known as birth control pill, is suitable for most healthy women, regardless of age, and can be used long-term.[2]The combination pill contains the hormones estrogen and progestin, a form of progesterone. When a woman uses the combination pill, the eggs in her ovaries do not mature [3]. There are two main types of hormonal contraceptive formulations: combined methods which contain both an estrogen and a progestin, and progestogen-only methods which contain only progesterone[4].

Oral contraceptives are used to prevent pregnancy. Estrogen and progestin are two female sex hormones. Combinations of estrogen and progestin work by preventing ovulation. They also change the lining of the uterus to prevent pregnancy from developing and change the mucus at the cervix [5].

These include depo-medroxyprogesterone acetate, norethisterone enanthate, and combined injectable contraceptives of different combinations of estrogens and progestin's. Current formulations of injectable

contraceptives are highly effective. One injection of DMPA inhibits ovulation for 14 weeks, suppressing both FSH and LH. Cervical mucus is thickened, decreasing sperm penetration [6]. The aims of these study was to determines the effects of use steroidal contraceptives on functions of kidney and lipid profile in sera of women used them .

Materials and Methods

The study has carried out in Samarraa General Hospital from (November 2016) to (May 2017). The study included(80)women who take contraceptive types, their ages (25-30) years old. As well as choosing random group included (20)Sample of healthy women of age (30-25) years old. The samples divided into three groups :-

*- Group No.1: included women who take a Combined Oral contraceptive, they were (40) women.

*- Group No.2: included women who take a Combined injectable contraceptive., they were (40) women.

*- Group No.3: - included (20) healthy women.

Method Of Collection The Sample

Collected (100) blood sample from women who take contraceptive types And from healthy women of age (30-35) years old. The blood samples were taken from the vein .10 mL from each patient, the blood

was put in disposable test tubes. The tubes are empty of (EDTA) in order make Total proteins & Biochemical tests. After that, The blood was left at room temperature for 20 minutes, The blood was separated by using a centrifuge at speed of (3000) rpm for 10 minutes. The serum was extracted by using Micropipette, put 1mL of blood serum in the disposable tube in order to make total proteins and other tests .And 1mLof in another test tube to make Biochemical tests.

Determination of creatinine

It has been measured creatinine level in the serum of the blood by following the steps attached with inspection (Kit) provided by(BioLabo) Company France [7].

Determination of uric acid

It has been used the enzyme method to evaluate the uric acid in the serum of the blood by following the steps attached with inspection (Kit) provided by (BioLabo) Company France [8].

Determination of Cholesterol concentration: It have been used the enzyme method to evaluate the Cholesterol in the serum of the blood by using the (Kit) to estimate the Cholesterol equipped (Biolabo) Company mad in France with number 02160[8].

Determination of Triglycerides concentration: It have been used the enzyme method to evaluate the Triglycerides in the serum of the blood by using the (Kit) to estimate the Triglycerides equipped (Biomaghreb) Company mad in France with number 20133[9].

Determination of HDL – Cholesterol concentration: It have been used the enzyme method to evaluate the HDL-Ch. in the serum of the blood by using the (Kit) to estimate the HDL-Ch. equipped (Biolabo) Company mad in France with number 02160[8].

Determination of Total S.Protein concentration:It have been used Biurete Method to evaluate the proteins of the serum ,the Chromatographic intensity was at 546 Nanometer [10].

Determination of Albumin concentration:It have been measured Albumin in the serum of the blood by following the steps attached with inspection (Kit) provided by(BioLabo) Company France[11].

Results and Discussion

Table (1) the Concentration of the (Creatinine, Uric acid) at in the women Used Contraceptives types compare with control.

The Sample	numbers	Creatinine Concentration mg\dl Mean + S.D	Uric acid Concentration mg\dl Mean + S.D
Group(1)	40	22.7 ** ± 1.4	2.1±2.2*
Grou Group(2)	70 40	19.1* ±1.0	2.16* ±3.22
Group(3)	20	2.1* ±0.6	2.43** ± 5.23

** significant increase at level P<0.01

* significant decrease at level P<0.01

The results in the table (1) and figure (1,2)Showed a significant increase in the Creatinine Concentration levels and Showed significant decrease in the Uric

acid Concentration levels in the women serum used Contraceptive types in comparison with the control group, and this agrees with results study of [12][13].The cause of that due to the Contraceptive types which causes a decrease of the Uric acid Concentration, because the Steroid drugs led to decrease in urea genesis in the women [13]. Some studies showed that using Combined Oral Contraceptive for a long time cause decrease of the Uric acid in the serum and there is a huge decline in the glomerular filtration rate in the women who take Combined Oral and injectable contraceptive compared with the women who did not take Combined Oral and injectable contraceptive[14][15]. while the increase in the Creatinine levels due to the using Steroid drugs[12].

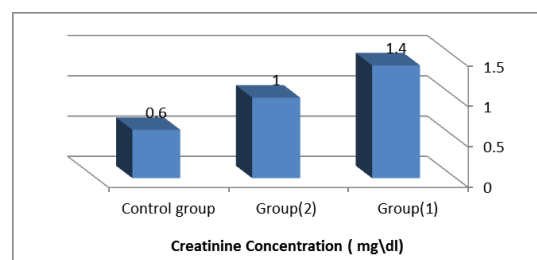


Figure 1: The Concentration of the Creatinine in the women Used Contraceptives types compare with control

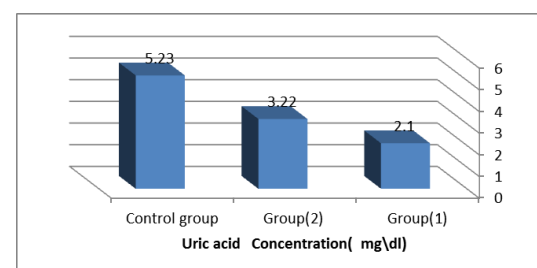


Figure 2: The Concentration of the Uric acid in the women Used Contraceptives types compare with control

Table (2) the Concentration of the Blood Proteins (Total Protein, Albumin) at in the women Used Contraceptives types compare with control

The Sample	numbers	Concentration Total Protein (mg/dl) Mean + S.D	Concentration lbumin(g/dl) Mean + S.D
Group(1)	40	3.7± 0.31*	3.31± 0.30*
Grou Group(2)	70 40	4.2±1.02*	2.3± 0.12*
Group(3)	20	7.2± 2.31	5.2± 2.11

** significant increase at level P<0.01

* significant decrease at level P<0.01

The results in table (2) and figure (3,4)Showed significant decrease in Total Protein and Albumin levels in the women serum used Contraceptive types in comparison with control group ,and this agrees with results study of [16]The cause of that due to the Progesterin's it has direct effect on proteins Metabolism or physiological failure of the liver. because of the long time using to Contraceptive types cause a decrease in the Total Protein and reduction of some Amino Acid in plasma and Albumin [17].The Urinary Albumin Excretion increase due to the Oral

Contraceptive and Progesterin's caused Hypoalbuminemia leads to decrease in Total Protein levels on a wide range, and lowering in Albumin levels[18].

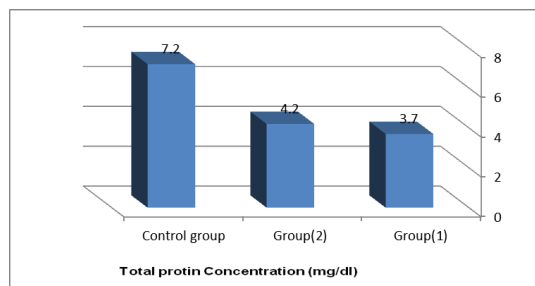


Figure3: The Concentration of the Total Protein in the women Used Contraceptives types compare with control

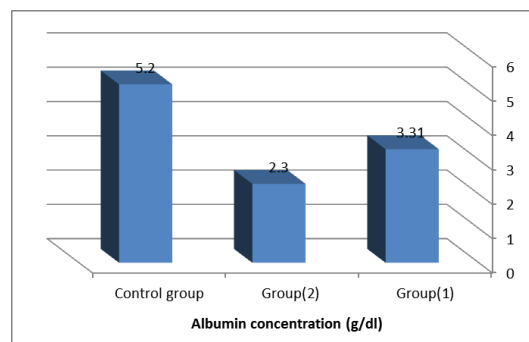


Figure 4: The Concentration of the Albumin in the women Used Contraceptives types compare with control

Table (3) the Levels of the lipids at in the women Used Contraceptives types compare with control

The Sample	numbers	Cholesterol (mmol/L) Mean + S.D	Triglestried (mmol/L) Mean + S.D	HDL (mmol/L) Mean + S.D	LDL(mmol/L) Mean + S.D	VLDL (mmol/L) Mean + S.D
Group(1)	40	173.7±25.3**	85.6±7.5**	55.4±6.15*	109.6±28.7**	13.1±1.63*
Grou Group(2)	70	170.1±22.1**	75.1±6.6**	±5.4*50.2	26.5** ±100.8	12.0±0.52*
Group(3)	20	159.0±27.1	65.9±8.14	57.8±3.11	84.1±31.2	1.51±17.12

** significant increase at level P<0.01

* significant decrease at level P<0.01

The results in the table (3) and figure (5,6,7,8,9) Showed a significant increase in lipids levels (Triglestried, Cholesterol, LDL-c) and Showed significant decrease (HDL-c) in the women serum used Contraceptives types in comparison with control group, and this agrees with results study of [19].The Oral Contraceptives caused an increase of the lipids, the Progesterone hormone causes an increase LDL-c and decrease HDL-c while Estrogen hormone causes an increase Triglestried, Cholesterol [20].Changes in the lipids in women using Oral Contraceptives (OC) because the Estrogen to increase LDL-c , Triglestried, while reducing HDL-c [21] [22] .the study of using Contraceptives types increase total Cholesterol levels in plasma.

But the study indicated that Triglestried increase in the women using Desogestrel / Ethinylestradiol [22].The low dosage of Estrogen, Progesterone hormone in the Combined Oral Contraceptive Pills (COCs) reduce side effects of lipids and total protein in the plasma [23] the Reason of decrease(HDL-c) in the women sera due to the increase of estradiol free level and biological Active a long menstrual cycle [19].

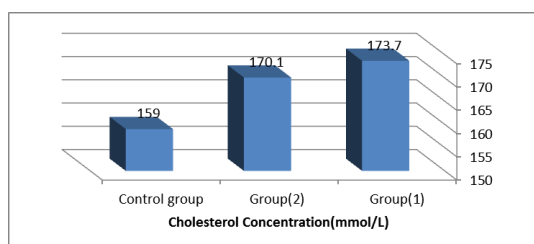


Figure 5: The Concentration of the Cholesterol in the women Used Contraceptives types compare with control

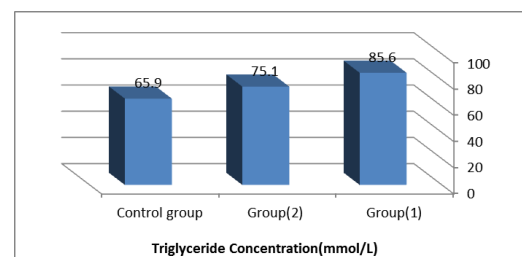


Figure 6: The Concentration of the Triglestried in the women Used Contraceptives types compare with control

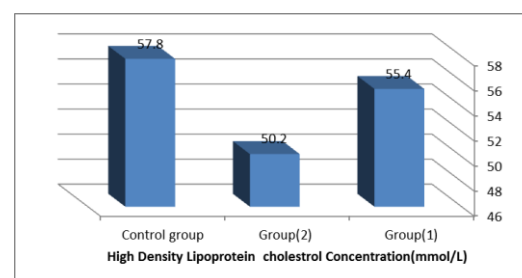


Figure 7: The Concentration of the High Density Lipoprotein in the women Used Contraceptives types compare with control.

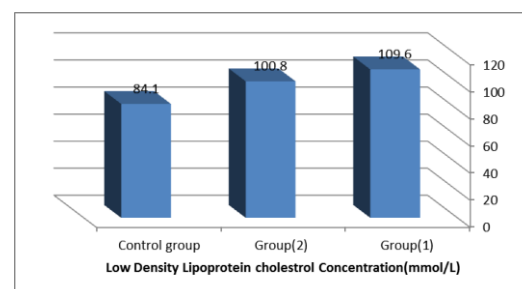


Figure 8: The Concentration of the Low Density Lipoprotein in the women Used Contraceptives types compare with control

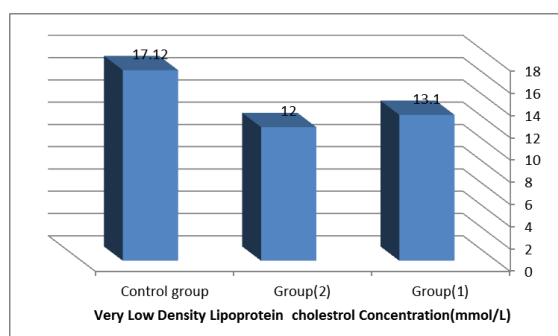


Figure 9: The Concentration of the Very Low Density Lipoprotein in the women Used Contraceptives types compare with control

References

- 1- Gupta BBP; Lachhandama K (2002). "Molecular mechanisms of glucocorticoid action" 83 (9): 1103–1111.
- 2- Ricci ,S.S. and Kyle, T. (2009). "Common Reproductive Issues". Contraception. Lippincott Williams & Wilkins. p. 119.
- 3- National Prescribing Service (2009). "NPS News 54: Hormonal contraceptives - tailoring for the individual". Retrieved 19 March 2009.
- 4- Oesterheld, J.R.; Cozza, K. and Sandson, N.B. (2008). Med-Psych Drug –Drug Intractions update , Oral contraceptives . Psychosomatics : 49 (2). pp: 168-175.
- 5- Steinkampf, M.P.; Carr, B.R. and Blackwell, R.E. (1998). Contraception, In textbook of reproductive medicine . 2th . Carr BR ,Blackwell RE editors . Appleton and lange .pp: 707- 725 .
- 6- Newton, JR; D'arcangues, C and Hall, PE. (1994). "A review of "once-a-month" combined injectable contraceptives". J Obstet Gynaecol (Lahore). 4 Suppl 1: S1–34.]
- 7- Tietz, N.W.; Caraway, W.T.; Freir, E.F.; Kachmar, J.F. and Rawnstey, H.M. (1999). Fundameutaes of clinical chemistry W. B. sauhders company. Philadelphia, london . pp: 982-998.
- 8-Tietz, N.W. (1999)Textbook of clinical Chemistry, 3th Ed. C.A. Buetis, E.R. Ashwood, W.B. Saundersp. 809-856.
- 9 Fossati, p.(1982) Principle Clinical Chemistry, 28, 2077.
- 10- Kingsley, G.R.(1942). The Direct Burette method for the determination of serum protein as applied to photoelectric and visual- colorimetry J.lab.Clin.Med.,27:840-845 PP.
- 11- Jennifer, D. and Finbarr , D.P. (1982). Albumin by bromoeresol green –acase of lobaratory conservatism . Clin. Chem, 28(6).pp: 1407-1408.
- 12- Oelkers, W.K.; Foidart, J.M.; Dombrovicz, N.; Welter, A.and Heithecker, R. (1995). Effects of a new oral contraceptive containing antimineralecorticoid progestogen, Drospirenone, on the rennin - aldosterone system, body weight. blood pressure, glucose tolerance & lipid metabolism, J. Clin. Endocr .Metab; 80(6). pp: 1816- 1821.
- 13- Grody, W.W.; Chang, R.J.; Panagiolis, N.M.; Cederbaum, S.D. and Matz, D. (1994). Menstrual cycle and gonado steroid effects on symptomatic hypramoneemia of urea – cycle based and idiopathic aetiologies .Inherited metabolic disease : 17 (5).
- 14- Sumino, H.; Ichikawa, S.; Kanda, T.; Nakamura, T. and Sakamaki , T. (1999). Reduction of serum uric acid by hormone replacement therapy in postmenopausal women with hyperuriceamia . The lancet . 354 (9179) .pp: 650
- 15- Atthobari, J.; cansevoort, R. T.; Visser, S. T.; Dejong, P. E. and Lolkje W.T. (2006). The impact of hormonal contraceptives on Blood pressure, urinary albumin excretion & glomerular filtration rate. British Journal of clinical pharmacology : 63(2).pp: 224-231.
- 16- Savitr,R.; E.Sponzili and C. Wingerd. (2006). Effects of steroid contraceptives on serum protein fractions . Brazilian J. Obstetrics & Gynecology, 48. pp: 211-215.
- 17- Bakry, S. and Abu-Shaeir, W. (2010). Electrophoretic and histopathological studies on adult femal rats treated with depo-provera (DMPA), Astralian Journnal of Basic and Applied Sciences: 4(1). pp: 61-70.
- 18- Ribstein, J; Halimi, J.M. and Mimran, A. (1999). Renal characteristics and effect of angiotensin suppression in oral contraceptive users Hypertension : 90-5.
- 19- Olatunji, Lawrence A.; Soladoye, Ayodele O. and Oveyipo, Peter I. (2008). Effect of increased dietary cakiumon hemorheological, lipid and lipid peroxidation in oral contraceptive – treated female rats. Clinical Hemorheology and microcirculation : 38(2).
- 20- Loncar, D. (2007). Oral hormonal contraceptive – The influence on human genome & lipid status. J. Acta. Medica. Medianae , (46).
- 21- Goldstein, J. L. and Brown, M.S. (1990). Regulation of the mevalonate pathway . Nature :343. pp: 425- 430.
- 22- Foulon, T.; Payen, N.; Laporte, F.; Bijaoui, S.; Dupont, G.and Roland, F. (2001).Effects of two low –dose oral contraceptives containing ethinylestradiol and either desogestrel orlevonorgestrel on serum

lipids a lipoproteins with particular regaredo LDL size, Contraception:64(1).pp:11-6.
23- Koh, K.K.; Shin M.S.; Sakuma, I; Ahn, J. Y.; Jin, D.K. and Kim, H.S. (2004). Effects of conventional

or lower doses of hormone replacement therapy in postmenopausal women. Atheroscler Thromb Vasc Biol: 24. pp: 1516- 1521.

دراسة بعض المتغيرات الكيموحيوية في النساء المستخدمات لأنواع موانع الحمل الستيرويدية

ساريا ناجي محسن

قسم علوم الحياة ، كلية العلوم ، جامعة تكريت ، تكريت ، العراق

الملخص

تضمنت هذه الدراسة عينات دم أخذت من (100) عينة من النساء المستخدمات أنواع موانع الحمل الستيرويدية في مستشفى سامراء العام وسحبت (20) عينة دم من نساء (لم يستعملن موانع الحمل) كعينة سيطرة وقد تم توزيع العينات إلى ثلاثة مجاميع المجموعة الأولى: مجموعة النساء اللاتي يتناولن موانع الحمل الفموية المزدوجة وكان عددهن (40)، والمجموعة الثانية: مجموعة النساء اللاتي يستخدمن حقن موانع الحمل المزدوجة وكان عددهن (40)، والمجموعة الثالثة: مجموعة النساء اللاتي لم يستعملن موانع الحمل (سيطرة). لقد بينت نتائج البحث بوجود انخفاض معنوي في تركيز حامض اليوريك وارتفاع عالي المعنوية في تركيز الكرياتينين ($P < 0.001$) عند المقارنة مع مجموعة السيطرة. في حين أظهرت نتائج البحث انخفاض عالي المعنوية في تركيز بروتينات الدم الكلي والألبومين ($P < 0.001$) عند المقارنة مع مجموعة السيطرة. كما بينت نتائج البحث ارتفاع عالي المعنوية ($P < 0.001$) في تركيز كل من الكوليستيرول والدهون واطنة الكثافة والدهون الثلاثية، وانخفاضا معنويا ($P < 0.001$) في تركيز الدهون عالية الكثافة عند مقارنتها مع مجموعة السيطرة .