

## Study Effect of Oral Contraceptives pills in Some physiological and Biochemical Parameters and On Liver Function Of the Women In the City of Samarra.

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### Abstract

This study included ( 150 ) samples of women used Oral Contraceptive in (Samarra General Hospital) to investigated the effects of use Oral Contraceptive on the some physiological , biochemical and liver functions parameters . The samples were divided into three groups; the first group: -(60) women used combined oral contraceptive pill (COCs) the second group: -(60) women used Progesterone Only Pills(POPs). The third group was (30) women without contraceptive pills( control group) . The results of the study indicated significant decrease in LH,FSH hormone at level (P <0.01)when compared to the control group. while the results showed a rise in the concentration level of Cholesterol, Triglyceride,LDL at level (P <0.01)and significant decrease in the HDL when compared to the control group , the results of the study indicated significant decrease in the Enzyme of the livers at level (P <0.01)when compared to the control group.

### Introduction

The combined oral contraceptive pill (COCP), often referred to as the birth control pill or colloquially as "the pill", is a birth control method that includes a combination of an estrogen (estradiol) and a progestogen (progestin). When taken by mouth every day, these pills inhibit female fertility. They were first approved for contraceptive use in the United States in 1960, and are a very popular form of birth control. They are currently used by more than 100 million women worldwide and by almost 12 million women in the United States (1). Use varies widely by country, (2) age, education, and marital status. One third of women aged 16–49 in the United Kingdom currently use either the combined pill or progestogen-only pill,

(3) compared with only 1% of women in Japan. (4) Two forms are on the World Health Organization's List of Essential Medicines, the most important medications needed in a basic health system. (5) The pill was a catalyst for the sexual revolution. (6) World historians credit the pill as the most important contraceptive to transfer power about reproductive rights from men to women. (3) Combined oral contraceptive pills should be taken at the same time each day. If one or more tablets are forgotten for more than 12 hours, contraceptive protection will be reduced. (7) Most brands of combined pills are packaged in one of two different packet sizes, with days marked off for a 28-day cycle. For the 21-pill packet, a pill is consumed daily for three weeks, followed by a week of no pills.

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For the 28-pill packet, 21 pills are taken, followed by a week of placebo or sugar pills. A woman on the pill will have a withdrawal bleed sometime during the placebo week, and is still protected from pregnancy during this week. There are also two newer combination birth control pills that have 24 days of active hormone pills, followed by 4 days of placebo(8).

Combined oral contraceptive pills were developed to prevent ovulation by suppressing the release of gonadotropins. Combined hormonal contraceptives, including COCPs, inhibit follicular development and prevent ovulation as a primary mechanism of action(9) (7). Progestogen negative feedback decreases the pulse frequency of gonadotropin-releasing hormone (GnRH) release by the hypothalamus, which decreases the secretion of follicle-stimulating hormone (FSH) and greatly decreases the secretion of luteinizing hormone (LH) by the anterior pituitary. Decreased levels of FSH inhibit follicular development, preventing an increase in estradiol levels. Progestogen negative feedback and the lack of estrogen positive feedback on LH secretion prevent a mid-cycle LH surge. Inhibition of follicular development and the absence of a LH surge prevent ovulation(8). Estrogen was originally included in oral contraceptives for better cycle control (to stabilize the endometrium and thereby reduce the incidence of breakthrough bleeding), but was also found to inhibit follicular development and help prevent ovulation. Estrogen negative feedback on the anterior pituitary greatly decreases the secretion of FSH, which inhibits follicular development and helps prevent ovulation(6). Another primary mechanism of action of all progestogen-containing contraceptives is inhibition of sperm penetration

through the cervix into the upper genital tract (uterus and fallopian tubes) by decreasing the water content and increasing the viscosity of the cervical mucus(10). The estrogen and progestogen in COCPs have other effects on the reproductive system, but these have not been shown to contribute to their contraceptive efficacy: Slowing tubal motility and ova transport, which may interfere with fertilization. Endometrial atrophy and alteration of metalloproteinase content, which may impede sperm motility and viability, or theoretically inhibit implantation. Endometrial edema, which may affect implantation(4). Oral contraceptives come in a variety of formulations, some containing both estrogen and progestins, and some only containing progestin. Doses of component hormones also vary among products, and some pills are monophasic (delivering the same dose of hormones each day) while others are multiphasic (doses vary each day) (8)

### **Materials and methods**

The study has carried out in Samarra hospital from (February 2016) to (July 2016). The study included (120) women how take contraceptive pill, their ages (25-30) years old. As well as choosing random group included (30) Sample of women without use contraceptives of (control group) age (25-30) years old. The samples divided into three groups :- Group( No.1 ) included women how take Combined Oral contraceptive pill(COCs), they were (60) women. (Group No.2 ) included women how take Progesterone Only Pills(POPs) , they were (60) women .( Group No.3 ) included (30) control group women .

The Blood sample was collected from (150) women who take contraceptive pill and from control

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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 hormone & Biochemical tests. After that , The blood was left in room temperature for 20 minutes , The blood was separated by using centrifuge at speed of (3000) rpm for 10 minutes. The serum was extracted by using Micropipette ,put 1mL of blood serum in disposable tube in order to make hormone tests .And 1mLof in another test tube to make Biochemical tests.

**Measurement of LH hormone concentration**

The concentration of LH was done in the blood serum depending on measure of immune radiation (IRMA) by using the kit from IZOTOP company by following the instruction accompanied with the kit according to the company who made the machine Elisa (11).

**Measurement of FSH hormone concentration**

The concentration of FSH was done in the blood serum depending on measure of immune radiation (IRMA) by using the kit from IZOTOP company by following the instruction accompanied with the kit according to the company who made the machine Elisa(12).

**Measurement 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(13).

**Measurement 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(14).

**Measurement 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(13).

**Measurement of Asparate Transminase (G.O.T) and Alanine Transaminase (G.P.T)concentration**

It have been measured the activity of G.O.T , G.P.T enzyme in the serum of the blood by following the steps attached with enzyme inspection (Kit) provided by Randox-Lab.U.K. Company this method to estimate the Pyruvate the liberated by the reaction with the Nitrophil Hydrazene D.N.P.H(15).

Statistical Analysis: The data of study samples was collected and analysis statistically by using program (SPSS10) of windows. including (Mean  $\pm$ S.D). The significant differences at level (0.01).

**Results**

The results in table (1) and figure (1,2)Showed significant decrease in hormone levels FSH,LH in the women serum used Oral Contraceptive in comparison with control group .

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By back to the results in table (2) and figure (3,4) Showed significant decrease in liver enzyme (GOT, GPT) in the women serum used Oral Contraceptive in comparison with control group .

The results in table (3) and figure (5,6,7,8 and 9) Showed significant increase in lipids levels (Triglycerides, Cholesterol, LDL) and Showed significant decrease (HDL) in the women serum used Oral Contraceptive in comparison with control group .

### **Discussion**

The results in table (1) and figure (1,2) Showed significant decrease in hormone levels FSH, LH in the women serum used Oral Contraceptive in comparison with control group , and this agree with results study of (16) (17). The cause of that due to the Combined Oral Contraceptive Pills which causes decrease in levels FSH, LH, because the Estrogen hormone act as inhibitor of FSH and delay a development Follicular, and the Progesterone hormone work to inhibitor of LH , while Progesterone Only Pills caused inhibiting levels LH and preventing Ovulation (18).

The results in table (2) and figure (3,4) Showed significant decrease in liver enzyme (GOT, GPT) in the women serum used Oral Contraceptive in comparison with control group , and this agree with results study of (19). The cause of that due to the Combined Oral Contraceptive Pills of high levels Estrogen showed decrease of the activity of the level livers enzyme. This leads to damage the liver the long time using of the Oral Contraceptive leads to decrease the activity of ALT, AST (20). But the studies indicated that liver enzyme stable during pregnancy (21). Some studies showed that Estrogen increase generating (Hepatocytes ) and activity mobility .The

women more susceptible to disease than man to infected (Biliary Stones) (22).

The results in table (3) and figure (5,6,7,8 and 9) Showed significant increase in lipids levels (Triglycerides, Cholesterol, LDL) and Showed significant decrease (HDL) in the women serum used Oral Contraceptive in comparison with control group , and this agree with results study of (23). The Oral Contraceptives caused increase of the lipids , the Progesterone hormone act us increase LDL and decrease HDL while Estrogen hormone work us increase Triglycerides, Cholesterol (24). Changes in the lipids in a women using Oral Contraceptives (OC) because the Estrogen act us to increase LDL, Triglycerides, while reduce HDL (25) (26) .found that using Combined Oral Contraceptive Pills (COCs) increase total Cholesterol levels in plasma .

But the studies indicated that Triglycerides increase in the women using Desogestrel/Ethinilestradiol (27) .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 (28) Reason of decrease (HDL) in the women serum due to the increase of estradiol free level and biological Active along menstrual cycle (29).

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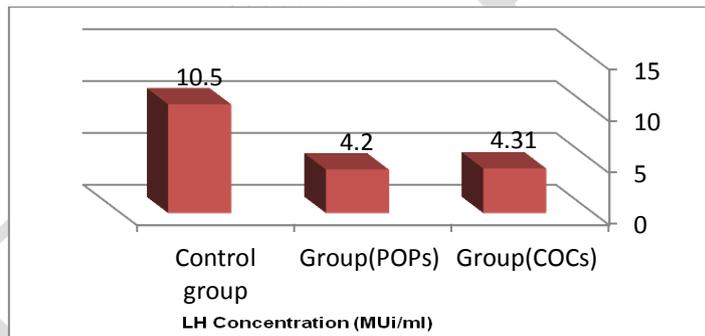
**Table NO.(1) Illustrated the Concentration of the hormones(LH,FSH) at in the women Used Oral Contraceptives compare with control.**

The Sample	numbers	Concentration LH(mIU/ml) Mean + S.D	Concentration FSH(mIU/ml) Mean + S.D
Group(COCs)	60	4.31± 2.34*	7.46± 2.24*
Group(POPs)	60	4.20± 2.1*	6.2± 1.12*
Control group	30	10.5± 6.72**	11.3± 7.24**

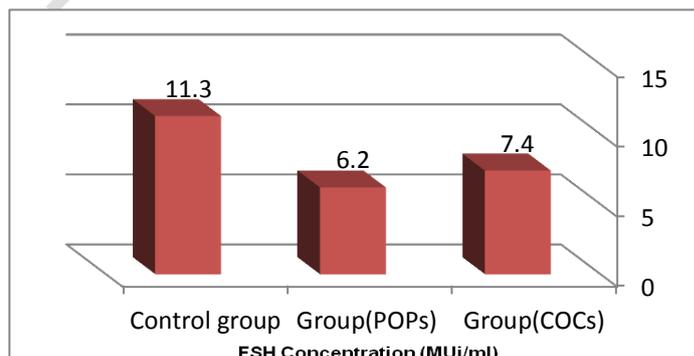
**\*\* significant increase at level P<0.01**

**\* significant decrease at level P<0.01**

**Figure 1: The Concentration of the hormones(LH) in the women Used Oral Contraceptives compare with control.**



**Figure 2: The Concentration of the hormones(FSH) in the women Used Oral Contraceptives compare with control.**



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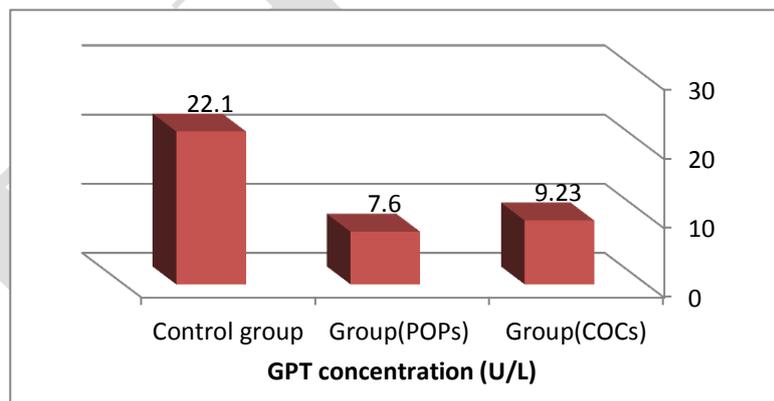
**Table NO.(2) Illustrated the Enzyme of the livers (GOT, GPT) at in the women Used Oral Contraceptives compare with control.**

The Sample	numbers	Concentration GPT (U/L) Mean + S.D	Concentration GOT (U/L) Mean + S.D
Group(COCs)	60	9.23± 1.48*	11.89± 1.53*
Group(POPs)	60	7.6±0.54*	8.00± 1.00*
Control group	30	22.1± 14.6**	20.3±12.2**

**\*\* significant increase at level P<0.01**

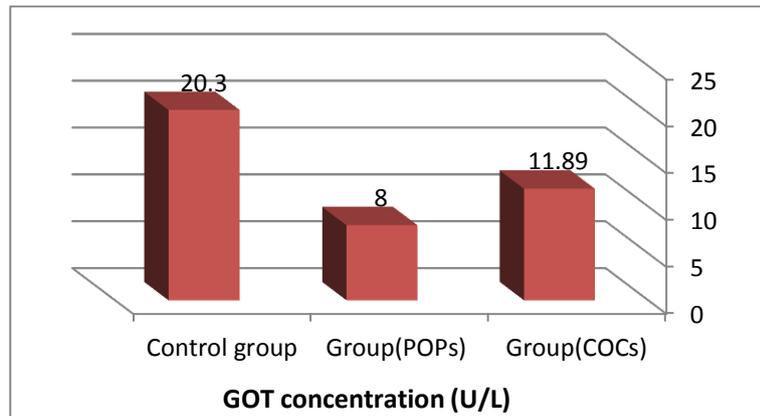
**\* significant decrease at level P<0.01**

**Figure 3: The Concentration of the GPT in the women Used Oral Contraceptives compare with control.**



**Figure 4: The Concentration of the GOT in the women Used Oral Contraceptives compare with control.**

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**Table NO.(3) Illustrated the Levels of the lipids at in the women Used Oral Contraceptives compare with control.**

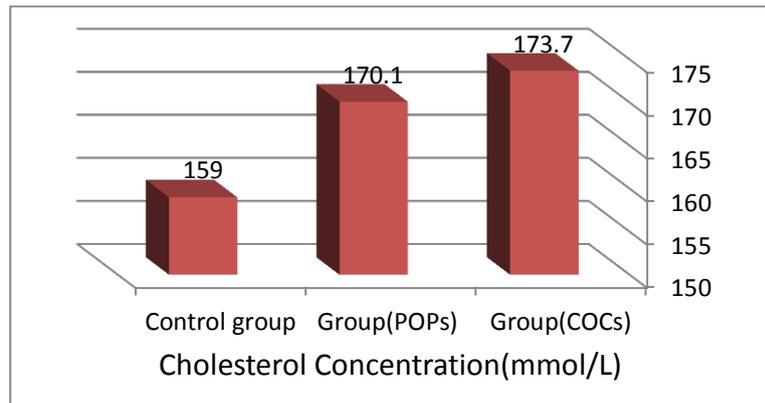
The Sample	NO.	Cholesterol (mmol/L) Mean + S.D	Triglestried (mmol/L) Mean + S.D	HDL (mmol/L) Mean + S.D	LDL(mmol/L) Mean + S.D	VLDL (mmol/L) Mean + S.D
Group(COCs)	60	173.7±25.3* *	85.6±7.5**	55.4±6.15*	109.6±28.7**	13.1±1.63*
Group(POPs)	60	170.1±22.1* *	75.1±6.6**	50.2±5.4*	± 26.5** 100.8	12.0±0.52*
Control group	30	159.0±27.1*	65.9±8.14*	57.8±3.11* *	84.1±31.2*	17.12±1.51 **

**\*\* significant increase at level P<0.01**

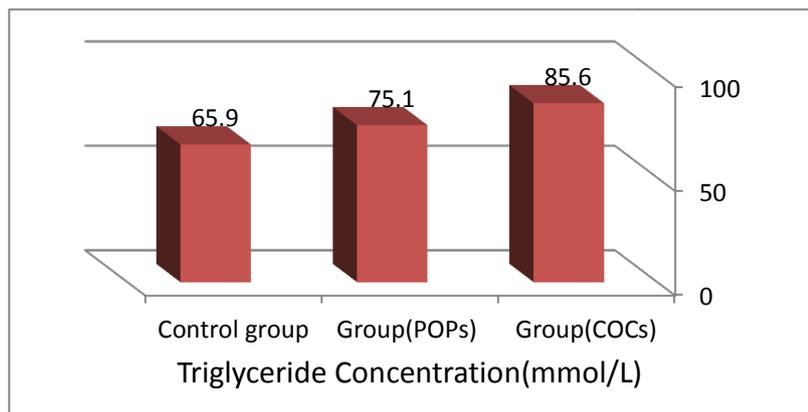
**\* significant decrease at level P<0.01**

**Figure 5: The Concentration of the Cholesterol in the women Used Oral Contraceptives compare with control.**

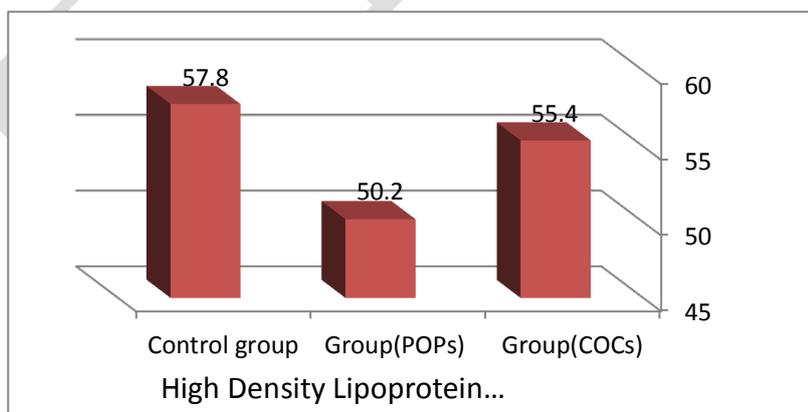
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***Figure 6: The Concentration of the Triglestried in the women Used Oral Contraceptives compare with control.***

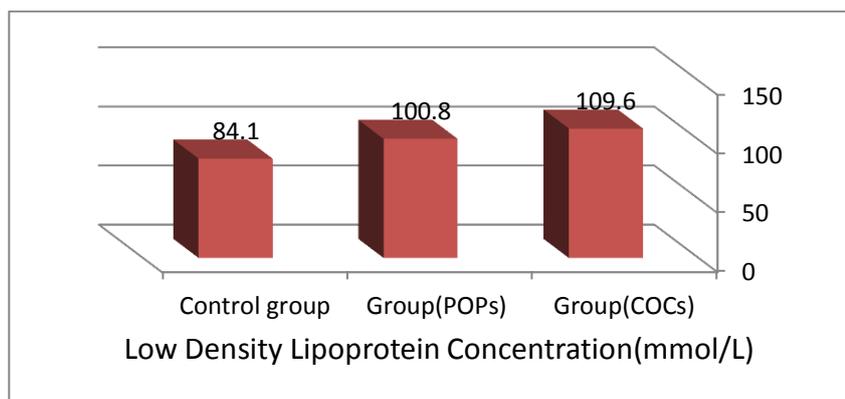


***Figure 7: The Concentration of the High Density Lipoprotein in the women Used Oral Contraceptives compare with control.***



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

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

