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Study of Some Changes of Blood Criteria in Women Who Take Combined Oral Contraceptives

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Abstract:
This study aimed to determine changes in some physiological and biochemical criteria when using combined oral contraceptives in several women in Diyala governorate. Through studying its effect on changes in Erythrocyte Sedimentation Rate(ESR) and haemoglobin concentration(Hb), as well as changes in glucose and cholesterol levels in women taking the pills.

In this study, 50 blood samples were used from women aged(20-40) who used combined oral contraceptives, and 25 blood samples were taken from healthy married women who were not pregnant and were not using any type of contraceptive and from the same age group as a control group.The study group was divided into two groups, the first group as acontrol group, and the second group represented the combined oral contraceptive group .

The results of the study showed a significant increase ($P < 0.05$) in the rate of erythrocyte sedimentation (ESR) in women using combined oral contraceptives compared to the control group.While there were no significant differences in haemoglobin concentration between the two groups.

As for the biochemical tests, it showed a significant increase in the concentration of both glucose and cholesterol in women using combined oral contraceptives compared with the control group at the level of significance ($P < 0.05$).This indicates the negative effects of women taking combined oral contraceptives and their effects on their health.

Keywords: combined oral contraceptive pills, cholesterol, glucose, haemoglobin, erythrocyte sedimentation rate (ESR).

Introduction: -

Voluntary control of fertility has taken up much of the attention of recent researchers[1]to find effective birth control methods that play a key role in helping women who cannot conceive because of health problems such as high blood pressure during pregnancy[2]haemorrhage, acute anaemia, cervix carcinoma[3]and other serious diseases , as well as helping women who want to organize the family and choose when and how often the pregnancy occurs [4]

Hence the importance of contraception in securing life, reducing morbidity and thus enhancing the quality of life [5][6] and preventing unwanted pregnancies.

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Contraceptive pills are available in different combinations, including[7]

1-Combined oral contraceptive pills (COC):

These tablets are made up of estrogen and progestin and these tablets may contain equal doses of estrogen and progestin called monophasic pills, or estrogen and progestin doses are unequal and are called multiphasic pills[8] .

2-Progestin contraceptive pills (POP): It contains only progesterone.

3-Sequential contraceptive pills (SCP):

It contains estrogen, which is given in the first half of the cycle and then given progesterone in the second half of it.

Progesterone and estrogens found in the combined contraceptive pills work to prevent pregnancy through a special mechanism where they work to raise the level of estrogen in the blood and thus inhibition of the secretion of the follicles Stimulating Hormone (FSH) and luteinizing hormone (LH) And then ovulation, without obstructing the movement of sperms in the uterine [9] .

The most common non-surgical contraceptive method is combined oral contraceptive pills (COC) for their high efficiency, but this does not mean that they are free of certain serious side effects [10][11].Therefore, the current study aimed to identify changes in ESR and concentration of blood haemoglobin in addition to changes in glucose and cholesterol levels in women taking pills.

Materials and methods:

The study was conducted at the Al/Batool Hospital for Obstetrics and Gynecology in Diyala province, the study included 50 samples of women using combined oral contraceptives between the ages of 20 and 40 years(second group), compared to 25 samples of married women who are not pregnant and do not use any contraception and from the same age group as a control group(first group). Blood samples were collected using a medical syringe, where 7 ml of blood was withdrawn, 2 ml of it was placed in a test tube containing an EDTA substance used for Physiological examinations, and the rest was placed in another tube that was not contained in anticoagulant material used directly for tests of biochemical.

Data collection:

- Erythrocyte Sedimentation Rate (ESR):The rate of erythrocyte Sedimentation was measured by the Westergren method[12].
- Blood haemoglobin level: The blood haemoglobin level was measured by using a Complete Blood picture device.
- Determination of cholesterol level in Blood serum: Total cholesterol level measured using Giesse Inc. ready-made measurement kit.

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- Determination of glucose level in blood serum:The concentration of glucose in the blood was measured in the colour system method using a ready-made measurement kit .

Statistical analysis:

The results were statistically analyzed using SPSS 16 and tested the least significant difference to compare red blood cell sedimentation levels, blood haemoglobin level, cholesterol and glucose concentration in women and to identify significant differences and the results were confirmed in the form of the mean ± standard deviation.

Results and discussion:

The results of the current study, as shown in table (1) showed the significant differences (P<0.05) in the ESR rate in women using hormonal contraceptives compared to the control group, where the mean of the first group (26.7 ± 11.2 mm\1h) and the second group meanwas (45.5 ± 17.5 mm\1h).Although the ESR test is unspecified, it is known to increase under certain physiological conditions[13].The Physiological effect of oral contraceptive pills is often similar to that of pregnancy [14], which may be the reason for the increase in ESR for oral contraceptive users.This is consistent with [15][16] .

The results also showed no significant differences (P<0.05) in the concentration of blood haemoglobin ratio between the first group and the second group, the Hb concentration mean for the first group (12.5±1.4 g\dl) and the second group concentration mean (12.7±1.5 g/dl).This contrasts with[17] , confirmed by an increase in the rates of haemoglobin of women who use COCs.While [18] no changes were observed in the Hb rate within six months of use.Many investigators suggest that OC does not significantly affect haemostatic parameters [19] .

The results also showed a significant increase (p<0.05) in the concentration of cholesterol in women using hormonal contraceptives compared to the control group, where the concentration mean of cholesterol for the first group (152.9 ± 46.5 ml\dl) and the second (187.25 ± 44.3 ml\dl).These results are consistent with the [20] which confirmed a significant increase in the concentration of cholesterol at the (P<0.001) level in the study groups compared to the control group.[21] mentioned that there is a significant statistical increase in cholesterol, LDL, TG, As for HDL, rhere was no statistical increase in it, that changes in fat when taking oral contraceptives are due to estrogen, where it increases the level of LDL, TG while reducing HDL,the high cholesterol level in women using combined contraceptive pills compared to the control group is because cholesterol is a key synthesis in generating Steroidogenesis [22].

The results also showed a significant increase (p<0.05) in the concentration of glucose among the group of women using hormonal contraceptives and control group,

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with the concentration mean of the first group (75.7200 ± 16.7 ml\dl) and the concentration mean of the second group (90.4700 ± 18.4 ml/dl).Here the results are identical to many studies that confirmed that oral contraceptives had a noticeable effect on glucose metabolism [23] The estrogenic component of contraceptives exerts a relevant role in the alteration of insulin sensitivity. [24] in this regard, studies in rats carried out by [25] show that, at the level of beta cells in pancreatic islets, estrogens can modulate insulin secretion.

From the results of the current study, we conclude the severity of oral contraceptivepills for women as it leads to a higher percentage of ESR and glucose in the blood as well as a high cholesterol ratio,therefore we recommend periodic regular check-ups for women who use hormonal contraceptives. Avoid taking combined oral pills for women suffering from cardiovascular disease and diabetes.

Table No. (1) shows the values of some of the criteria studied for women in the first and second groups

Parameters	**Group 1** **Means ± SD**	**Group 2** **Means ± SD**
ESR mm\1h	***26.7 ± 11.2**	**45.5 ± 17.5**
Hb g\dl	**12.5±1.5**	**12.7±1.4**
Cholesterol level ml\dl	***152.9 ± 46.5**	**187.25 ± 44.3**
Glucose level ml\dl	***75.7200 ± 16.7**	**90.4700 ± 18.4**

*** Indicates that there are significant differences between the groups of the experiment.**

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