RESEARCH ARTICLE

The Effect of Contraceptive Pills on the Physiological Parameters of Blood and Hormones on Women in Al-Qurna, Iraq

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ABSTRACT

This study was conducted to find out the use of oral contraceptive pills and their effect on some physiological blood parameters (platelet count, red blood cell count, white blood cell count, hemoglobin rate, physiological blood parameters, and cholesterol). The results between 10 women of reproductive age who were not taking oral contraceptives, and 10 women of reproductive age who were taking oral contraceptives showed no significant differences among physiological blood parameters ($p > 0.05$) but there were significant differences among estrogen and progesterone hormones in women who did not take birth control pills.

Keywords: Contraceptive pills, Blood parameters, Estrogen, Progesterone.

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INTRODUCTION

The contraceptive pill is one of the most common methods of contraception, as it began to be used in the sixties and contains the hormones estrogen and progesterone, or it is mono-hormonal and works to prevent ovulation at the same time. The mucus surrounding the cervix is thicker so it is difficult for sperm to pass through.[1]

The knowledge of scientists about the hormonal control systems responsible for human reproduction enabled them to know the reverse systems, which are the substances that are used to prevent fertilization and implantation of the fetus or both to prevent pregnancy. In 1940, a method was developed in which hormones were used as contraceptives, and many researches continued until contraceptive drugs were developed, which are doses of the hormones estrogen and progesterone that are generally used as pills and are now known as oral steroid contraceptives.[2]

The contraceptive pill is an effective means of family planning and reproductive health care for women who suffer from accompanying pregnancy problems such as hemorrhage, Acute anemia, and congenital hypertension.[3] Despite the appearance of some side effects of using these pills. It has gained great importance for their ease of use and its high efficiency in contraception compared to other contraceptive methods.[4] Therefore, some studies have examined its benefits and harms. Contraceptive pills contain a mixture of estrogen-only hormones or both estrogenic and steroidal hormones, which are similar in concentration to natural female nitrogenous hormones.[5]

The contraceptive pill with a passive feedback mechanism suppresses the gonadotrophin hormones secreted from the anterior lobe of the pituitary gland, which is a follicle-stimulating hormone and luteinizing hormone, by interfering with the function of the hypothalamic-ovarian axis.[6]

Some studies have confirmed that the contraceptive pill increases the risk of breast and cervical cancer in women with a genetic history of this disease.[7]

There are some side effects associated with the use of birth control pills headache, gingivitis, chest pain, nausea, vomiting, the appearance of black spots on the skin and its effect remains for a long time, Increased appetite and weight may increase, increased hirsutism and sudden bleeding.[8] It also causes depression by affecting the decrease in serotonin in the brain, as well as causing mood swings that tend to be sad. Benefits of contraceptive pills: Used to treat many health

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Table 1: The effect of oral contraceptive use on some functional blood parameters ± standard error

Standards	*PLT count rate $X10^3$/L*	*RBC count rate $X10^6$/L*	*WBC count rate $X10^3$/L*	*Hb rate g/dl*	*MCV rate fl*	*MCH rate pg*	*Hemoglobin effect rate MCHC g/dl*
Birth control pills users	349.20 ± 43.86	4.91 ± 0.13	8.09 ± 0.73	11.19 ± 0.63	72.18 ± 5.31	22.77 ± 1.22	29.36 ± 0.45
Non birth control pills users	336.20 ± 29.37	4.76 ± 0.12	7.32 ± 0.69	10.88 ± 0.40	77.31 ± 2.45	22.98 ± 1.00	29.65 ± 0.42
significance	0.80 NS	0.68 NS	0.45 NS	0.68 NS	0.39 NS	0.89 NS	0.64 NS

NS: Non-significant

conditions, reduce the risk of endometrial and ovarian cancer, cysts, endometriosis, reduce rheumatoid arthritis and increase bone density, reduce external pregnancies. It is an effective treatment in cases of abnormal uterine bleeding, dysmenorrhea, amenorrhea, ovulation-related bleeding, and premenstrual syndrome.[9]

Because of the review of the side effects of using the contraceptive pill and its benefits, the current study aimed to identify the effect of the use of contraceptive pills on some functional blood parameters, which included the percentage of red blood cells (RBCs), platelets (PLT), white blood cells (WBC), cholesterol, estrogen, and progesterone levels.

MATERIALS AND METHODS

Sample Collection

Blood samples were collected from 20 women who attended Al-Qurna General Hospital in Basra Governorate whose ages ranged between 22 to 40 and their weights ranged between 55 to 85, and who had given birth to at least one child. It was divided into two groups: Group one. It included 10 women who used oral contraceptive pills several months before their blood was drawn. Each strip contains 21 tablets, and each tablet consists of a low dose of 0.03 mg of ethinyl-estradiol (EE) with a dose of the highest amount (0.15 mg) of levonorgestrel and the strip contains 7 tablets of iron formate (75 mg) in each tablet. Group two, It is a control group and included 10 married women who did not use contraceptive pills and were not pregnant.

Venous blood samples were drawn for both groups using sterile medical syringes with a capacity of 3 mL of blood. The blood samples were placed in tubes containing the anticoagulant potassium EDTA to measure blood parameters using a complete blood image counting and analysis (CBC) device. Then the serum was separated using a centrifuge at 3000 rpm for five minutes, then the serum layer was isolated from the rest of the blood components. The serum was withdrawn using a mechanical micropipette and placed in new plastic tubes and kept under freezing (-20) for hormonal and cholesterol tests

Statistical Analysis

The data for the study samples were collected and analyzed statistically by using the SPSS statistical program, and the mean was estimated and using the repentance analysis ANOVA at a level of significance of 0.05 by identifying the differences between the arithmetic means.[10]

RESULTS

All the findings are consolidated and presented in the Tables 1-3.

DISCUSSION

The results of Table 1 showed an increase in the average number of platelets in the blood of women taking oral contraceptive pills, which amounted to 349.20, compared with 336.20 non-birth control pills users, but this increase did not reach the level of significance $p > 0.05$. We also note that there was no significant effect ($p > 0.05$) of taking pills by women on the level of red blood cell count 4.91 in the blood of women.

Women taking oral contraceptives compared to the level of red blood cell count in the blood of non-pill women 4.76

Table 1 shows the increase in the number of white blood cells in the blood of women taking oral contraceptives, where the number of cells was 8.09 compared to women not taking oral contraceptives, whose white blood cell count level reached 7.32, but this increase did not reach the level of significance $p > 0.05$.

In the level of hemoglobin in the blood of women taking oral contraceptives, their hemoglobin level was 11.19 compared to the hemoglobin level of women not taking oral contraceptives 10.88 g/dl.

Table 2: WBC count

Cell type	*Birth control pills users*	*Non birth control pills users*	*Significance*
Lymphocytes 10^3/L	2.92 ± 0.29	2.27 ± 0.19	0.08 NS
Neutrophils	4.79 ± 0.43	4.44 ± 0.67	0.67 NS
Monocytes mono	0.57 ± 0.05	0.46 ± 0.04	0.14 NS
Eosinophils	0.19 ± 0.04	0.11 ± 0.02	0.11 NS
Basophils	0.03 ± 0.06	0.04 ± 0.07	0.91 NS

NS: Non-significant

Table 3: Hormones and cholesterol measurement

Groupe	*Progesterone ng/mL*	*Estrogen pg/mL*	*Cholesterol Mmol/L*
Birth control pills users	0.74 ± 0.13	23.89 ± 7.83	4.33 ± 0.29
Non birth control pills users	10.23 ± 1.99	126.55 ± 36.48	3.63 ± 0.21
Significance	0.00*	0.01*	0.07 N.S

*: significant

As for the standard blood parameters, which include mean corpuscular volume, mean corpuscular hemoglobin, and mean corpuscular hemoglobin concentration, no significant effect of oral contraceptive use was observed, p>0.05, by women, which reached 72.18, 22.77, and 29.36, respectively.

The results of Table 1 showed that the contraceptive pill did not lead to a significant effect.

Table 2 shows the identification number of white blood cells, where the percentage of lymphocytes was 2.22, the percentage of neutrophils was 4.79, the percentage of mononuclear cells was 0.57, the percentage of eosinophils was 0.19, and the percentage of stromal cells was 0.03 for women taking oral contraceptives compared with women who were not taking oral contraceptives. 0.04, 0.11, 0.46, 4.44, and 2.27, respectively, and there were no significant differences (p >0.05).

As we note from the results of Tables 1 and 2 there is no significant effect on taking oral contraceptive pills on the average number of platelets, the number of red blood cells, the hemoglobin rate, the number of white blood cells, and standard blood parameters, where the study agreed with.[11]

The reason may be attributed to a slight decrease in the volume of blood lost during the use of birth control pills that do not stimulate the bone marrow to produce new cells.[12-15]

Table 3 shows the results of hormones and cholesterol, where the percentage of cholesterol among women taking oral contraceptives was 4.33 compared to 3.63 women who were not taking oral contraceptives, and there were no significant differences p >0.05.

As shown in Table 3, the hormones progesterone and estrogen were recorded among women taking oral contraceptives (23.89, 0.74), respectively, compared with women not using oral contraceptives (126.55, 10.23), where we note the superiority of women who are not using oral contraceptives. Significant p <0.05 in the concentrations of progesterone and estrogen compared with women taking oral contraceptives, and this is due to the inability of the ovaries to develop the Krave follicles, which are the main source of estrogen production,[16] which has an important role in preparing the uterine lining to receive the fetus as well as its role in lowering the concentrations of the hormone FSH and stimulating the secretion of the hormone LH to trigger the ovulation process.[17-20]

CONCLUSION

No significant differences among physiological blood parameters, but there were significant differences among estrogen and progesterone hormones in women who did not take birth control pills.

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