RESEARCH ARTICLE

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Measuring Some Physiological and Clinical Indicators for Women Using Contraceptives in Diyala Governorate

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ABSTRACT

Introduction: Various types of hormonal and non-hormonal contraceptives are highly efficient and widely used, with the most common ones being combined oral contraceptives and copper intrauterine devices. Contraceptive methods use different strategies including the inhibition of ovulation, alteration of the structure of the endometrium, and densification of the cervical mucosal barrier. These strategies depend on factors such as the type of progestin, length of activity, endogenous hormone levels, and the degree of estrogenic, androgenic, anti-androgenic, glucocorticoid, and anti-cortical activity

Objective of the study: The current study aims to determine the levels of physiological variables in women who use contraceptives.

Materials and Methods: Samples were collected from Al-Batoul Teaching Hospital, family planning department, private clinics, and health centers in Diyala governorate from July to October 2023. A total of 90 women were enrolled in this study According to the inclusion criteria, 50 women used contraceptive methods (study group), while the other 40 females did not use any contraceptive method (control group). These women were healthy. Blood sampling was conducted by extracting 5 ml of venous blood using a sterile, disposable medical syringe which was then inserted into a centrifuge tube for separation in a centrifuge for 15 minutes to obtain plasma. The levels of PT, PT, INR, and LUPUS were determined using calcium thermoplastine to measure the clotting time of the patient's plasma and compare it to the normal standard. This test measures the clotting factors such as proaccelerin V, proconvertin VII, fibrinogen I, prothrombin II, and stuart X.

Results: The results of the current study show that there are significant differences ($p<0.05$) between the levels of PTT and the two study groups. It was found that PTT levels were high in patients (36.72 ± 7.16) compared to healthy people (32.40 ± 3.51). On the other hand, in the current study, no significant differences ($p>0.05$) were observed between the levels of PT, INR, and Lupus, and the two study groups. The current study showed no significant differences ($p>0.05$) between the levels of coagulation factors and contraceptives (hormonal and non-hormonal). The results of the current study show no significant statistical differences ($p>0.05$) between the coagulation factors and the time of contraceptive use in patients.

Conclusions: The study showed a significant increase in PTT values in both study groups. Hormonal and non-hormonal contraceptives did not show any significant change in the coagulation factors of women using contraceptives, and the time period did not influence the use of contraceptives on blood clotting factors.

Keywords: Oral contraception, Estrogen, Progestagens, Thrombosis, Blood Coagulation.

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INTRODUCTION

Hormonal contraceptives have broad and multiple effects on the body's functions in general. One of these effects is on blood pressure, which depends on the cardiac output rate. Peripheral resistance depends on other factors, including the release of hormones, growth factors, and neurological factors. Some studies report that women who take pills suffer from high blood pressure due to the effect of estrogen and progesterone on cardiac output and an increase in the concentration of renal mRNA, which can lead to the narrowing of blood vessels and increased blood pressure. Studies also report a change in body weight[1]. The liver is also deeply affected by the hormones found in contraceptives, and these effects can be considered harmful. For example, estrogen affects liver function by increasing the production of certain hormones, manufacturing types of globulins and proteins, and the carrier fibrinogen while reducing the synthesis of hepatic globin in the blood[2].

Estrogen affects fat metabolism, as it works to increase cholesterol saturation in bile. When the rate of these changes increases, it leads to an increased probability of developing stones. Combined Oral Contraceptives (COCs) are one of the most commonly described contraceptives used by more than 100 million women worldwide[3]. Several studies have shown that women taking combination oral contraceptives show changes in coagulation. There has been an increase in plasma concentration of fibrinogen, coagulation factors XII, II, VII, IX, and X, as well as a decrease in antithrombin concentration[4]. These changes may lead to an increased risk for venous thrombosis if they are not offset by an increase in fibrinolysis activity or other inhibitor proteins such as C. Epidemiological studies indicate that oral contraceptive use increases the risk of Venous Thrombosis (VT) from 0.8 per 10000 women per year in pre-menopausal women not using contraception to 3.0 per 10000 per year among oral contraceptive users. A difference in VT caused by oral contraceptives containing same dose of estrogen but different compounds of progestin[5].

METHODS

This study was conducted on a group of non-pregnant women using different contraceptives. The contraceptives used included the dual oral contraceptive microgynon formula, which contains 30μg of EE and 150μg of levonorgestrel and is taken daily. The contraceptive injection, Depo-provera, is administered once every three months. The study also included the use of a non-hormonal IUD. The group of women included individuals in different age stages, with a total enrollment of 90 women who met the inclusion criteria. Of these, 50 women used contraceptives (study group), while the other 40 females did not use any contraceptive method (control group). All women were healthy.

Sample Collection

Samples were collected at Al-Batoul Teaching Hospital (Family Planning Department), private clinics, and health centers from July to October 2023. The samples requested in the study were interviewed and a questionnaire was filled out to record the sample information, including name. Age, type of contraceptive material (pills, injections, IUD, strip), time period for taking the contraceptive, number of children, other diseases, and use of different medications.

Blood Samples

Were collected by withdrawing 7 ml of venous blood using a single, sterile medical syringe and inserted into a tube and used to measure PT, PT, INR, and LUPUS blood clotting tests. Prothrombin test, PTT Prothrombin Test PT Prothrombin time is a clotting test that measures the activity of clotting factors (I, X, VII, V, II) Test principle Principle test The test principle includes the use of calcium thermoplastin to measure a patient's plasma clotting time and compare it to the standard The test measures a coagulation factor: (Proaccelerin V, proconvertin VII, fibrinogen I, prothrombin II, Stuart X Blood on each side is Placed On A Tube Tube (PTT) and centrifuged for 15 d at 2500 RPM The samples are then stored frozen at 20-temperature until testing is performed.

Measure the Level of PT, PTT, INR, LUPUS

Add 100 ml of the sample plasma to the plastic test cube and incubate it for two minutes at 37 degrees Celsius, then add 200 ml of the reagent after incubating it in incubate it at 37°C and record the clotting time.

It is intended to determine the time of activated molecular thyropolysteine after insertion into the tube by adding ml50 of the special reagent PTT and then adding 100ml of calcium chloride cacl2 to hold the reaction after incubation at 37 m for 3-5d and record the time of thrombosis by coagulation after insertion into the tube. The INR value is calculated from the following equation:

$$\text{INR} = \frac{Mean\ Pation\ PT}{Normal\ PT}$$

Place the sample in the device's tube, add 50 ml of the LUPUS special reagent to it, and then add 100 ml of Calcium Chloride (CaCl2) to stop the reaction After being incubated at 37 m for 3-5 d, the time of thrombosis is recorded by clotting after being placed in the device.

Statistical Analysis

Statistical analysis was conducted using SPSS v. 25, Graph pad prism v.6 and Excel 2013. The data are described Ordinal and nominal in number and percentage form, and comparison between percentages was done using the Chi-square test. The quantitative data were described in Mean ± SD format the arithmetic means were compared using the T and F test. The Least Significant Difference (LSD) test was used to compare the means significant differences were calculated at a significance level of $P \leq 0.05$.

RESULTS

Effect of Clotting Factors on Study Groups

The results of the current study show that there are significant differences ($p<0.05$) (Table 1) between

the levels of PTT in the two study groups. It was found that PTT levels were higher in patients (36.72 ± 7.16) compared to healthy individuals (32.40 ± 3.51). However, no significant differences were observed in the current study ($p>0.05$).

This study was not compatible with[6], which showed no significant differences between contraceptive users and healthy PTT levels, as well as PT, INR, and Lupus levels. The result of the current study[7] is that women taking Combined Oral Contraceptives (COCs) showed a slight change in coagulation criteria. This may be due to the type of inhibitor containing the second-generation 2d progestin, which has a lower risk and effect on coagulation criteria than the third generation. Several studies have shown that COCs increase the risk of venous thrombosis up to six times[8].

In another study, there was a significant difference between PT, INR, and Fib values, whereas no significant difference in PTT value was observed among study groups. This study indicates that women using COCs remain at a similar increased risk for venous thrombosis. This may be... Due to increased insulin resistance using COCs, there is an increased fat content, leading to cardiovascular clots[9]. Because of the similar physiological and chemical characteristics of women using contraceptives and pregnant women, the concentration of coagulation factor levels can be considered comparable between pregnant women and non-pregnant women using contraceptives. However, the current results were not consistent[10].

Current results show an increase in Lupus levels in patients compared to healthy people with no significant difference. Systemic lupus erythematosus is a disease that affects women of reproductive age. While service providers previously advised SLE patients to avoid pregnancy, improvements in disease management and a better understanding of drug safety make pregnancy possible for most SLE patients. Careful planning of pregnancy, when the disease is well controlled with pregnancy-compatible drugs, is critical. Patients at high risk of preeclampsia (older or younger patients, patients with hypertension, previous renal disease, presence of phospholipid antibodies) are encouraged to initiate aspirin treatment (81 mg/day). In the first trimester[11], researchers concluded that pregnancy is at a high risk for women with SLE. The SLE Disease Activity Index (SLEDAI) and the third complement protein (TH3) are the main risk factors for SLE deterioration during pregnancy, and combined Antiphospholipid Syndrome (APS) and SLEDAI are the main risk factors for fetal loss. Therefore, reasonable and effective strategies must be formulated based on these factors to reduce the risk of adverse pregnancy outcomes[12]. A previous study showed that the frequency of pregnancy complications was higher in women with pre-existing SLE. The most undesirable pregnancy outcome for women with SLE was spontaneous abortion. SLE duration before pregnancy has been significantly associated with certain outcomes, including Low Birth Weight (LBW), eclampsia, and stillbirth. Increased C-reactive protein, kidney impairment, positive RNA antibodies, positive APS, and reduced age at. The beginning of the disease leads to an increased risk of pregnancy complications[13]. A recent study shows that women with SLE have a history of Lupus Nephritis (LN) associated with fetal loss and eclampsia. Active nephritis has been associated with poor pregnancy results and fetal loss[14] (Figure 1).

Effect of Clotting Factors on Barrier Type (Hormonal or Non-Hormonal)

The results of the present study show no significant differences ($p>0.05$) between the levels of clotting factors and contraceptives (hormonal and non-hormonal (Table 2).

The study[15] showed an increase in normal levels of plasma concentration of fibrinogen and prothrombin activity in all women receiving steroid hormones. The higher platelet count corresponds to the group treated with the transdermal formulation ethinylestradiol and norgestromin. Furthermore, except for the control group, a decrease was observed in INR and PTT, with values within the normal ranges[16]. Another study showed that hormonal contraceptives are the most commonly used method, but their effects cannot be ignored on a coagulation profile. Prothrombin Times (PT) and APTT decreased, with a slight increase in fibrinogen but a significant decrease in antithrombin levels. We must educate about non-hormonal contraception to reduce risk[17]. Although conflicting results have been reported with regard to the use of Oral Contraceptives (OCPs) and Hormone Replacement Therapy (HRT) in women with SLE, their use increases the risk of flares. or cardiovascular disease in patients with phospholipid antibodies or history of blood clot.

Table 1: Compare clotting factor levels between study groups.

Groups		N	Mean	Std. Deviation	P value
PT (sec)	Patients	50	14.88	2.54	P>0.05
	Healthy	40	14.03	1.25	
PTT (sec)	Patients	50	36.72	7.16	p<0.05*
	Healthy	40	32.4	3.51	
INR (sec)	Patients	50	1.08	0.08	p>0.05
	Healthy	40	1.06	0.02	
Lupus (sec)	Patients	50	42.24	9.07	p>0.05
	Healthy	40	40.28	8.45	

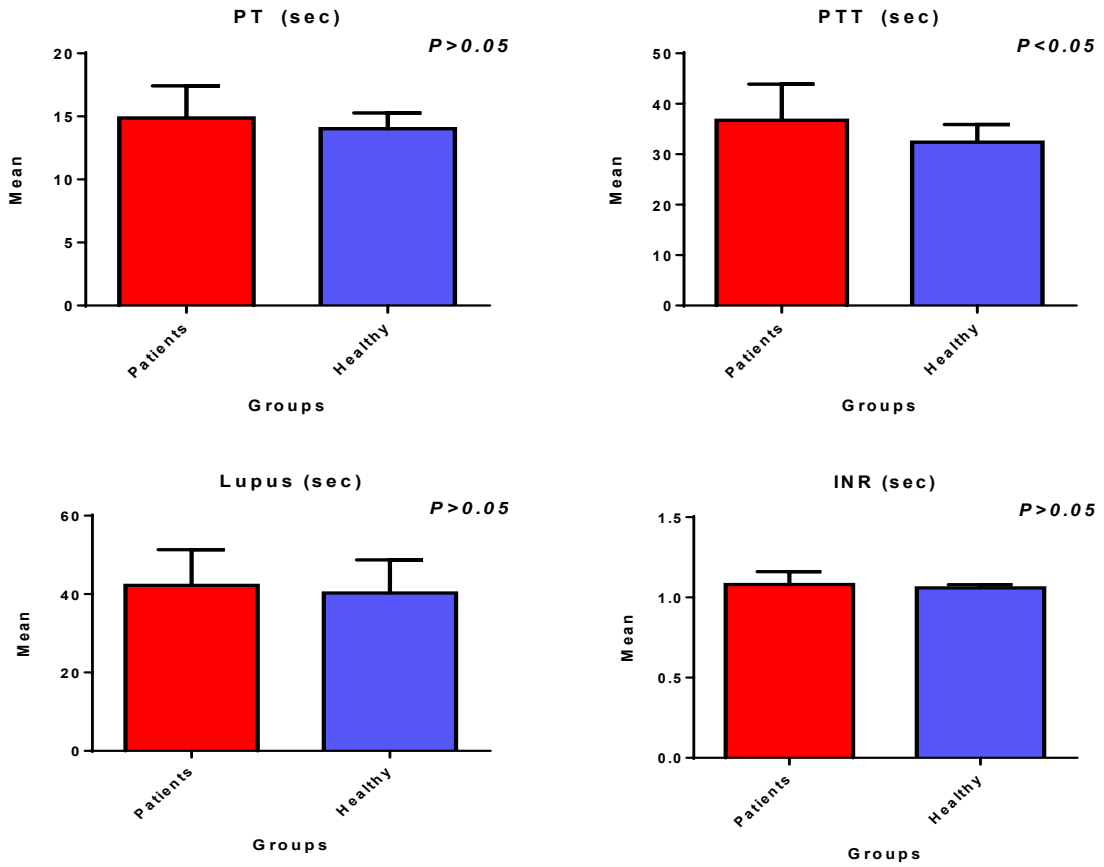

Figure 1: Compare clotting factor levels between study groups.

Table 2: Compare clotting factor levels with hormonal and non-hormonal contraceptive substances.

Contraceptives		N	Mean	Std. Deviation	P value
PT (sec)	Hormones	30	15.4	3.07	P>0.05
	Un hormones	20	14.1	1.12	
PTT (sec)	Hormones	30	37.9	8.2	P>0.05
	Un hormones	20	35.95	4.91	
INR (sec)	Hormones	30	1.09	0.09	P>0.05
	Un hormones	20	1.06	0.06	
LUPUS (sec)	Hormones	30	42.6	8.89	p>0.05
	Un hormones	20	41.7	9.54	

Table 3: Compare clotting factor levels with contraceptive history.

Contraceptive date		N	Mean	Std. Deviation	P value
PT (sec)	01-Dec	27	14.48	2.42	P>0.05
	13-24	9	16.44	3.68	
	25-36	6	14.67	1.51	
	37-48	4	14	0.82	
	49-60	4	15.25	2.06	
PTT (sec)	01-Dec	27	36.04	5.14	P>0.05
	13-24	9	40.33	13.77	
	25-36	6	35.33	3.67	
	37-48	4	35.5	4.43	
	49-60	4	36.5	3.42	
INR (sec)	01-Dec	27	1.06	0.07	P>0.05
	13-24	9	1.11	0.12	
	25-36	6	1.09	0.06	
	37-48	4	1.05	0.06	
	49-60	4	1.11	0.09	

	01-Dec	27	42.67	10.1	
	13-24	9	39.44	7.32	
LUPUS (sec)	25-36	6	39.17	3.25	P>0.05
	37-48	4	47.75	9.98	
	49-60	4	44.75	10.31	

Effect of clotting factors on the duration of contraceptive use

The results of the current study show no statistically significant differences (P>0.05) between clotting factors and the time of contraceptive use in patients (Table 3).

CONCLUSIONS

The study showed a significant increase in PTT values in both study groups. Hormonal and non-hormonal contraceptives did not show any major change in the coagulation factors of women using contraceptives, and the time period did not influence the use of contraceptives on blood clotting factors.

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