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# Effect of Oral Contraceptives on Coagulation Parameters among Sudanese Women in Khartoum state

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## Abstract

**Background:** The contraceptive pills are the common name for oral contraception; it's one of the safest, Methods of birth control.

**Objectives:** To evaluate the Effect of oral contraceptives treatment on the Coagulation parameters (PT, APTT, and D-Dimer) among Sudanese women.

**Materials and Methods:** A descriptive cross sectional study conducted at Khartoum State, Sudan, during the period of May 2018 to December 2018.sixity nine (N = 69) patients using oral contraceptive pills were included in this study. Venous blood was obtained and platelets poor plasma (PPP) prepared, then PT, APTT determined using Coagulo-analyzer. D-Dimer measured by quantitative method using Ichroma analyzer.

**Results:** The present study showed that there was no significant differences in mean of PT in study group compared to the mean normal control (p value = 0.06) .In the other hand the mean of INR is significantly (p value = 0.04) increased in study group compared to the mean of normal value (mean = 1.05 and 1.0 respectively), whereas APTT was significantly decreased in study group (compared to the mean of normal value (mean = 31.3, 33), (p value = 0.001). But the D-Dimer was positive for 8 women (11.6%) (D-Dimer = > 10000 ng/ml).

**Conclusion:** There was significant decrease in APTT, D-Dimer was positive in 11.6 % in contraceptive women, while there was no change in PT result in study group.

***Keywords:*** *Contraceptive Pills; PT; APTT; D-Dimer*

## Introduction

Oral contraceptives (pills) are intentional prevention of conception. There are several types of contraceptives pills that have been officially labeled because they have shown reliability in preventing conception from occurring [1]. The contraceptives are one of the safest, most effective and popular methods of birth control. The pill is made up of synthetic forms of hormones that naturally occur in a female's body, progesterone and estrogen [2]. The pill works by stopping the action of the hormones that trigger ovulation and preventing the release of an egg, it also thickens the cervical mucus, so it makes it hard for sperm to swim [3]. Oral contraceptives related thrombosis

has become an important field of study. Women taking oral contraceptives appear to have ~ (3 - 4) fold increased risk of thrombosis (primarily Deep venous thrombosis in the lower extremities) compared to women not taking oral contraceptives, the risk is lower in young women without other risk factors for thrombosis, higher in older women or women with other risk factors. Oral contraceptives can interact with inherited thrombophilia, notably factor V Leiden [4]. Women who are heterozygous for the mutation and take oral contraceptives have a ~30, fold increase in risk of deep venous thrombosis compared to women without the mutation and not taking oral contraceptives, women who are homozygous for the Mutation and take oral contraceptives have a several hundred fold increase in risk of thrombosis [5]. D-dimer is a fibrin degradation product (or FDP), a small protein fragment present in the blood after a blood clot is degraded by fibrinolysis. It is so named because it contains two D fragments of the fibrin protein joined by a cross-link [6]. D-dimer concentration may be measured by a blood test to assist investigate thrombosis. From the time when its introduction in the 1990s, it has become an important test performed in patients with suspected thrombotic disorders. While a negative result practically rules out thrombosis, a positive result can indicate thrombosis but does not rule out potential causes. Its major use, so, is to keep out thromboembolic sickness where the possibility is low down. In addition, it is used in the diagnosis of the Blood disorder disseminated intravascular coagulation.

## Materials and Methods

This is a descriptive cross sectional study conducted at academic hospital in Khartoum- Sudan. All women using oral contraceptive pills during the period of May 2018 to December 2018, were included in this study, excluding those with any other coagulation disorders, diabetes mellitus, hypertension, pregnancy, and then informed and written consent has been taken from women who participated in this study. Venous blood samples were collected in citrated tubes adding 2.5 ml of blood, then PPP was prepared and PT and aPTT were obtained using coagulo-analyser, D-Dimer was quantitatively measured using ichroma analyzer. Data analysis was done by Statistical Package for the Social Sciences (SPSS) version 20 using computer software. Descriptive statistics were applied to summarize patient characteristics; one sample T test was applied for comparisons. The p. value < 0.05 was considered as statistically significant. A correlation was applied for comparisons. The p. value < or = 0.05 was considered as statistically significant.

## Results

The study showed that there is no significant differences in mean of PT in study group compared to the mean normal control (p value = 0.06) as seen in figure 1. In the other hand the mean of INR is significantly (p value = 0.04) increased in study group compared to the mean of normal value (mean = 1.05 and 1.0 respectively) (Figure 3). Whereas APTT was significantly decreased in study group (compared to the mean of normal value (mean = 31.3, 33) (p value = 0.001) (Figure 2 and Table 1). But the D-D was positive in 8 women (11.6%) (D-Dimer = >10000 ng/ml). There were no significant association between PT, PTT, D-Dimmer tests and the duration time and age of women that use the oral contraceptive (P. value > 0.05) as seen in table 2 and 3).

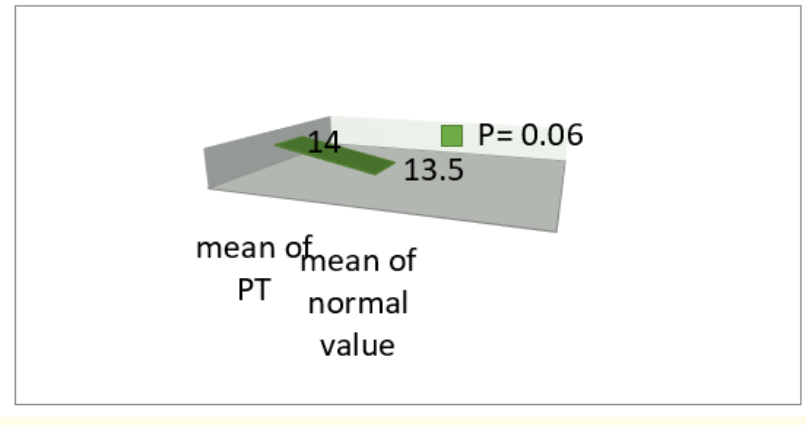


***Figure 1:*** *Mean difference of PT in study group.*

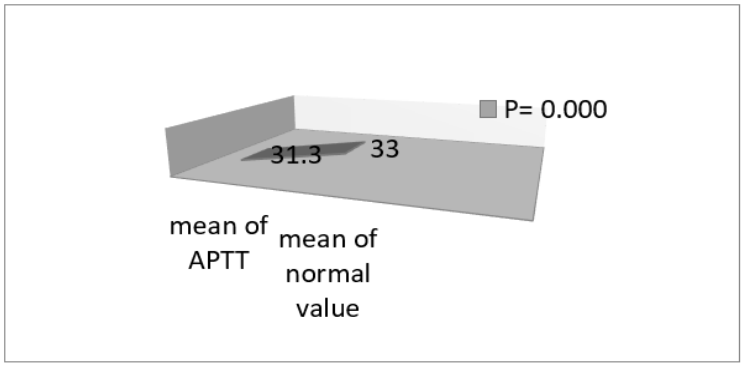


***Figure 2:*** *Mean difference of APTT in study group.*

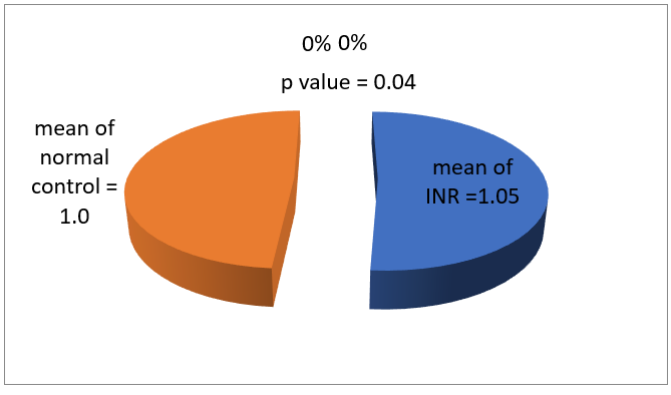


***Figure 3:*** *Mean difference of INR in study group.*

| D-Dimer positive | D-Dimer negative |
|---|---|
| 11.60% | 88.40% |

***Table 1:*** *Percent of D-Dimer in study group.*

| Parameters | Age | Mean | P value |
|---|---|---|---|
| PT | 20 - 40 years | 14.1127 | 0.17 |
| | More than 40 years | 12.8167 | |
| APTT | 20 - 40 years | 31.1667 | 0.06 |
| | More than 40 years | 33.6500 | |
| INR | 20 - 40 years | 1.0567 | 0.93 |
| | More than 40 years | 1.0650 | |
| D-dimer | 20 - 40 years | 5233.7151 | 0.91 |
| | More than 40 years | 5058.9700 | |

***Table 2:*** *The mean differences in PT, APTT, INR and D-Dimer in age group.*

| Parameters | Correlation with duration | |
|---|---|---|
| | R value | P value |
| PT | 0.04 | 0.7 |
| APTT | 0.1 | 0.39 |
| INR | 0.1 | 0.37 |
| D-Dimer | -0.09 | 0.4 |

***Table 3:*** *Correlation of PT, APTT, INR and D-Dimer with duration of contraception.*

## Discussion

The result showed that there is no significant differences in mean of PT in study group compared to the mean normal control, whereas APTT was significantly decreased, this study in agree with study done by Ghazanfar Ali Sirhindi., *et al.* (2016) and they revealed that APTT was significantly decreased in patients with contraceptive, and disagree with them in that the PT was significantly decreased [11]. Also this study was agree with study done by Mohieldin Abass Elsayid., *et al.* (2016) and they concluded that: PT was not affected by contraceptive treatment [13] and also this result was agree with that done by Ibeh N., *et al.* (2015) and they concluded that APTT was lower in women with contraceptive [10], also this result is totally disagree in study published by Abiola Samuel Babatunde and P O Olatunji (2005) and they concluded that PT was significantly decreased and APTT showed no significant differences [12]. The study revealed that there was 11.6% of women with contraception were D-dimer positive (increased D_D), so this result is agree with study done by Ghazanfar Ali Sirhindi., *et al.* (2016) [11] which revealed that the D-dimer was significantly increased in contraceptive patients.

## Conclusion

The oral contraceptives treatment had no effect on PT. But had a little effect on APTT and D-Dimer level.

## Recommendations

1. By this study we are not able to recommend the using of oral contraceptive is effect on coagulation parameters.
2. More studies should be done about the effects of oral contraceptive on coagulation parameters involve large sample size and different ethnic groups.
3. Health education.

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