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EVALUATION OF PROTEIN C, PROTEIN S AND FIBRINOGEN OF PREGNANT WOMEN IN OWERRI METROPOLIS

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Abstract

This study was performed to evaluate the levels of protein C, protein S and fibrinogen in pregnant women in the municipality of Owerri. The study was conducted at the Owerri Federal Medical Center in Imo, Nigeria. A total of 400 subjects from 1845 years of age were recruited for the study. The study included 300 pregnant women and 300 non-pregnant women who attended the Owerri Federal Medical Center Obstetrics and Gynecology Hospital. Five milliliters (5 ml) of venous blood was obtained from each participant using standard venipuncture and placed in a simple

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serum collection container. The results showed an increase in protein C (*P= 0.015)* and protein S (*P = 0.014)*, with no significant difference in fibrinogen *(P = 0.729*) in pregnant women compared with non-pregnant women. .. Pregnancy has been shown to have an effect on protein C and protein S levels, but not on fibrinogen levels.

Keywords*: Protein C, Protein S, fibrinogen, pregnant women.*

Introduction

Pregnancy is an exciting experience for women of childbearing age. It brings joy and fulfillment to all mothers and to all society. Pregnancy brings many changes that can affect the outcome of the pregnancy and the mother's life. Since the survival of society depends on the success of pregnancy, great attention should be paid to maternal and child health (Obeagu, 2018; Obeagu et al., 2014; Obeagu et al., 2014; Obeagu et al., 2014). , 2021; Ifeanyi et al., 2020). Obeagu et al., 2020). Pregnancy is associated with changes in hemostasis, including increased coagulation factors, decreased amounts of natural anticoagulants, and decreased fibrinolytic activity (Bremme, 2003). There is an increase in blood loss and dilution, with the greatest decrease in late pregnancy (O`Riordan and Higgins, 2003).

Thrombolysis is reduced during pregnancy due to decreased tPA activity, but tPA activity remains low 1 h after birth until activity returns to normal. This decrease was due to a gradual, ultimately triplicate increase in plasminogen activator inhibitor 1 (PAI1) and increased levels of plasminogen activator inhibitor 2 (PAI2) (O). 'Riordan & Higgins). The placenta produces PAI1 and is the main source of PAI2. Adult PAI2 levels are 25-fold higher than in normal plasma (Kruithof et al., 1987). After delivery, when PA1 levels drop, tPA levels quickly return to normal. However, PA2 levels remained elevated for several days.

Materials and methods

Study area

This study was carried out in Federal Medical Centre Owerri in Imo State, Nigeria.

STUDY POPULATION AND SAMPLE SIZE

A total of 400 subjects from 1845 years of age were recruited for the study. 200 pregnant women visiting the Owerri Federal Medical Center for Obstetrics and Gynecology and 200 non-pregnant women were eligible to participate in the study.

INFORMED CONSENT

Participants were recruited from pregnant women who had scheduled antenatal care appointments. The second group consisted of uninfected pregnant women and uninfected non-pregnant women randomly selected from hospital staff.

INCLUSION CRITERIA

- • Pregnant women with no signs of infection, other inflammatory or chronic diseases.
- • Pregnant women from 1845 years old.
- • Pregnant women every three months
- • All women of the same age who are not pregnant and have no signs of infection will be considered as controls

EXCLUSION CRITERIA

- Those excluded from the study were:
- • Pregnant women with signs of chronic infections such as HIV, tuberculosis and inflammatory diseases;
- • Women without their consent;
- • Pregnant women requiring urgent care or carrying a high-risk pregnancy such as gestational diabetes, preeclampsia and eclampsia;
- • Non-pregnant women with signs of chronic infection.

SAMPLE COLLECTION

Five milliliters (5 ml) of venous blood was collected from each participant using standard venipuncture techniques and distributed into a conventional container for serum collection.

LABORATORY PROCEDURES

All reagents were purchased commercially and the manufacturer's standard operating procedures (SOPs) were strictly followed.

FIBRINOGEN ASSAY

As modified by GIESSE Diagnostics was used.

Procedure

Samples and controls were diluted 1/10 with imidazole buffer (50 µL + 450 µL). 200 µL of the pre-diluted sample was pipetted into a plastic tube and incubated for 5 min at 37 °C. 100 µl of bovine thrombin was added and the required clotting time was recorded.

PROTEIN C ASSAY

Commercial Kit by MELSIN diagnostics was used. Catalogue Number: EKHU-1392.

Procedure

50 µl of standard was pipetted into the standard wells. Pipette 10 µL of test serum into each sample well. 40 µL of sample diluent was added to the sample well. 100 µl HRP conjugation reagent was added to all wells, covered with adhesive tape and incubated for 60 min at 37 °C. It was washed four times. 50 µL of chromogen solution A and 50 µL of chromogen B solution were added to each well. The mixtures were incubated for 15 min at 37°C. 50 µl of stop solution was added to each well. The optical densities of the samples were read in a microtiter plate reader at 450 nm for 15 min.

PROTEIN S ASSAY

Commercial Kit by MELSIN diagnostics was used. Catlogue Number: EKHU-1232.

Procedure

50 µl of standard was pipetted into the standard wells. Pipette 10 µL of test serum into each sample well. 40 µL of sample diluent was added to the sample well. 100 µl HRP conjugation reagent was added to all wells, covered with adhesive tape and incubated for 60 min at 37 °C. It was washed four times. 50 µL of chromogen solution A and 50 µL of chromogen B solution were added to each well. The mixtures were incubated for 15 min at 37°C. 50 µl of stop solution was added to each well. The optical densities of the samples were read in a microtiter plate reader at 450 nm for 15 min.

Statistical analysis

The results were analysed using SPSS of version 20 with student t-test and p-value set at $p<0.05$ as significant.

Results

Table 1: showing mean values of Protein C, Protein S and Fibrinogen of pregnant women compared to apparently non-pregnant women

Parameters	Pregnant women	Non-pregnant women	t-value	p-value
Protein C	2.13±2.73	1.12±0.82	2.489	0.015*

Protein S	15.80±6.89	9.60±4.57	2.507	0.014*
Fibrinogen	270.83±26.92	273.84±55.21	-0.347	0.729NS

The results showed increase in Protein C (2.13±2.73, 1.12±0.82, p=0.015) and Protein S (15.80±6.89, 9.60±4.57, p=0.014) and no significant difference in Fibrinogen (270.83±26.92, 273.84±55.21, p=0.729) of the pregnant women compared to non-pregnant women respectively.

Discussion

The results showed an increase in protein C (p = 0.015) and protein S (p = 0.014), with no significant difference in fibrinogen (p = 0.729) in pregnant women compared with non-pregnant women. .. Pregnancy has been reported to lower protein C and protein S levels, and the opposite was true in this study, when they were elevated compared with non-pregnant women. Fibrinogen is reported to increase during pregnancy and to levels about 200 years after pregnancy (Bremme, 2003), but this study showed changes in pregnant women compared with non-pregnant women. Decreases in protein C and protein S have been reported in pregnant women compared with controls. This is due to a decrease in tPA activity, which remains low for 1 hour after birth until activity returns to normal. This decrease was due to a gradual, ultimately triplicate increase in plasminogen activator inhibitor 1 (PAI1) and increased levels of plasminogen activator inhibitor 2 (PAI2) (O). Riordan and Higgins, 2003). The placenta produces PAI1 and is the main source of PAI2. Adult PAI2 levels are 25 times higher than in normal plasma (Kruithof et al., 1987). However, in this study, protein C and protein S increased.

Conclusion

In this study, there was an increase in protein C and protein S, and there was no significant difference in fibrinogen in pregnant women compared with non-pregnant women. Pregnancy has been shown to have an effect on protein C and protein S levels, but not fibrinogen levels.

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