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DETERMINATION OF CLOT RETRACTION IN PREGANANT WOMEN ATTENDING ANTENATAL CLINIC IN FEDERAL MEDICAL CENTRE OWERRI, NIGERIA

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ABSTRACT

This study was carried out to determined clot retraction on pregnant women. A total of 100 pregnant women attending antenatal clinic in Federal Medical Center Owerri were used in the study while 100 non- pregnant women were used as control. The platelet count was determined using the improved Neubauer ruled counting chamber and clot retraction time was also determined using the standardized method for clot retraction time. The platelet count level (230810± 6109.99) and clot retraction time (1.5606± 0.04390) were significantly decreased when compared with control (295900± 8114.29 and (1.6206± 0.05173) respectively (P< 0.05). Hence this result could probably suggest that pregnancy has effect on platelet count and clot retraction time and there is need for platelet court and clot retraction time to be determined during pregnancy especially when there is need for caesarean surgery.

Keywords*: clot retraction, pregnant women, antenatal clinic, platelet, thrombolytic agents*
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INTRODUCTION

Clot retraction is the shrinking of blood clot facilitated by thrombolytic agents. Clot retraction also refers to a regression in size of blood clot over a number of days. It generally occurs within 24 hours of initial clot formation and decreases the size of the clot by 90%, while the clot retracts, the wound begin to heal (Martini *et al.*, 2012)

A blood clot is a mass formed within a blood vessel to stop bleeding by; blockading the wound, preventing the escape of blood from the blood vessels. Formation of a blood clot is a multi-step process that is tightly regulated (Kee, 2010). Blood clot formation normally starts with injury to a blood vessel, which causes it to constrict, called the vascular phase, this is the first reaction of a blood vessels to damage. It reduces the flow of blood to the site of injury, minimizing blood loss.

Next, the circulating platelets clump along the site of blood vessel injury. The platelet form a foundation for a blood clot and release chemicals that stimulate clotting. The coagulation phase then causes a blood clot to form. Clotting occurs when an enzyme called thrombin converts a soluble protein, fibrinogen, into its insoluble form, fibrin. Fibrin proteins make up the bulk of a blood clot (Maitini *et al.,* 2012). Thrombin is activated by the merging of two pathways, the intrinsic and extrinsic pathways, into the common pathway. These are initiated by different part of the body after blood vessel damage. Coagulation factors are central to the action of these pathways. Each factor activates the next in a stepwise fashion.

While the process of coagulation as such has been the subject of numerals investigations the last phase of this process, the clot retraction has not been so extensively studied, and some confusion still exists concerning the meaning of clot retraction and the basic mechanism involved. Clot retraction cannot be compared to the syneresis observed in a colloid gel, since the former occurs far more rapidly (Ollgaard, 2001). The factor which is assumed to affect the process is found in the thrombocytes, and although there is some difference opinion as to the

part played by the platelets in the process of coagulation, general agreement exists as to their importance in clot retraction.

Only intact platelets are active in the later process, if they have been damaged by physical interference or an extract of them is used, no effect is obtained. Thus it must be possible to employ clot retraction as a quantitative test of the platelet function. (Ollgaard, 2001). The retraction seems to depend not only on the function of the platelets, but also on the surface tension, the number of erythrocytes, qualitative and quantitative variations in the fibrin and the surface with which the clot is in contact.

MATERIALS AND METHOD

SUBJECT AND STUDY AREA

The hospital is located at the Orlu Road axis of Owerri town, along which the Alvan Ikoku Federal University of Education is as well located in Owerri the capital city of Imo State in Eastern part of Nigeria.

Apparently 100 pregnant and 100 non-pregnant (control) women were investigated in Federal Medical Center Owerri, The consent of these patients were obtained after detailed explanations of the nature and goals of the research. This research was carried out between February and March, 2017.

ETHICAL APPRO VAL/INFORMED CONCENT

Permission was duly obtained from the ethical committee of Federal Medical Center Owerri.

SAMPLE SIZE

100 samples of pregnant patients were used in this study,

COLLECTION OF SAMPLES

5mls syringe filled with standard gauge disposable middle was used to withdraw blood without undue pressure from the patient arm, Then with the aid of automatic pipette, 20pl (0.02ml) of blood

was immediately dispensed into 0.38ml of ammonium oxalate in a test tube for platelets count and the remaining (4.98ml) was dispensed into a sterile clean dried centrifuge tube for clot retraction test.

METHOD FOR DETERMINATION OF PLATELET COUNT).
IMPROVED NEUBAUED RULED COUNTING CHAMBER

Procedure

0.38ml of filtered ammonium oxalate diluting fluid was dispensed into a small tube. 20pi (0.02ml) of well mixed anticoagulated venous blood was mixed blood was mixed into the diluting fluid. Assembling of the counting chamber. The central grid areas of the chamber and the special haemacytometer coyer glass was completely clean and dry, the cover glass was slide into position over the grid areas and press down on each**.** side until rainbow colours (Newton's rings) was seen, Prior moistening of the cover glass was slide into position over the grid areas and press down on each side until rainbow colours (Newton's rings) was seen. Prior moistening of the chamber surface on each side of the grid areas was done to help the cover glass to adhere to the chamber. The diluted blood sample was re-mixed using a Pasteur pipette held at an angle of about 45°, while filling the grids of the chamber with the sample, taking care not to overfill the area. The chamber was left undisturbed for 20minutes. To prevent drying of the fluid, the chamber was placed in a petri dish on dampened tissue and was covered with a lid. The underside of the chamber was dried with a cotton wool and was placed on the microscope stage. Using the lx objective, to focus the ruling of the grid, the central square of the chamber was brought into view. The objective lens were changed to the 40x objective for counting of the platelets. They were seen as small bright fragments. The number of platelets in 1 litre of blood was reported as the actual number of platelets counted x 10^9.

METHOD FOR DETERMINATION OF CLOT RETRACTIONTIME.

Procedure

3ml of venous blood was obtained and dispensed carefully into a 13 x 100mm glans test tube. The

test tube was placed in the 37°c water bath and allowed to clot. As soon as the blood had clotted, the clot was inspected at 1, 2, 4 and 24hours for the formation of a retracted clot. The results were reported on the length of time it took for the clotted blood to retract.

RESULTS

Table 1: The mean value of platelet count of pregnant women

Parameter	**Control (n = 100)**	**Pregnant Women n=100**	**P value**
Platelet	295900± 8114.29	230810± 6109.99	P<0.05

The result showed that there is a significant decrease in platelet count (230810±6109.99) when compared to the non- pregnant women (Control) (295900± 8114.29).

Table 2: The mean value of clot retraction time of pregnant women

Parameter	**Control(n=100)**	**Pregnant Women n=100**	**P value**
Clot retraction Fraction	1.6206±0.05173	1.5606±0.04390	P<0.05

Table 2: showed a signification decrease in clot retraction time of pregnant women (1.5606± *0.04390)* when compared to the non- pregnant women (Control) (1.6206± 0.05173).

DISCUSSION

This study has clearly determined the clot retraction in pregnant women. The results from our study show platelet to be significantly low in pregnant women when compared with the control (230810± 6109.99). This agrees with the observation of Lea and Philadelphia (2004) that there is

a slight progressive decrease in platelet count during pregnancy. This decrease in platelet count during pregnancy could be attributed to hemodilation. The increase in plasma volume results from the effect of material hormone production. It has been suggested that material concentration of estrogen and progesterone increases a hundred fold during pregnancy (Ballen, 2017). The activity of estrogen increases plasma renin activity which enhances renal sodium reabsorption and water retraction by means of the renin angiotensin aldosterone system in resulting in retraction of large amount of total body water during pregnancy (Paul *et al.,* 2006). This hemodilation that occurs during pregnancy may be essential for maintaining the patency of teroplacental vascular bed. This is important because increased blood viscosity may be associated with thrombosis. This work also show that there is decreased clot retraction during pregnancy when compared with the control (1.5606± 0.04390) and (1.620t± 0.05173). This supports the observation made by Lea and Philadelphia (2004) and (Ahmed *et al.,* 2000) that there is decreased blot retraction even if the platelet number is normal. This may be indicative of platelet dysfunction as a result of enzyme abnormalities or hormonal effects during platelet production for example thromboasthemia which is risk factor for bleeding during pregnancy.

CONCLUSION

There is no significant difference in platelet and clot retraction time of pregnant women. Decreased platelet number may be pathogenic to some extent but decreased clot retraction is indicative of platelet dysfunction, hence an increased bleeding tendency during pregnancy and delivery. Therefore, from the findings of this work, it can be deduced ‘that pregnancy has effect in platelet count and clot retraction. Hence, there is need for platelet count and clot retraction test during pregnancy especially where there is need for caesarean surgery.

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