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RESEARCH ARTICLE

STUDY OF PLATELET FUNCTIONS IN PREGNANCY AND PUERPERIUM ACCORDING TO PARITY

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ABSTRACT

Normal pregnancy is characterized by profound changes in almost every organ system to accommodate the demands of the fetoplacental unit. It also associated with changes in all aspects of haemostasis, including increase in concentrations of most clotting factors, decreasing concentrations of some of the natural anticoagulants and diminishing fibrinolytic activity. So present study aimed at to study the platelet functions that is study the platelet count and bleeding time (Dacei *et al.,* 1994) in pregnancy and puerperium according to parity in comparison to that of non pregnant of same age group. Here we found that the platelet count decreases and bleeding time increases in normal pregnancy possibly due to increased destruction and haemodilution with a maximal decrease in the third trimester than that of non pregnant. But immediately after delivery there is an increase in platelet count but the bleeding time decreases than that of non pregnant. In our study, difference in the study parameters are found in primi and multipara. So at the time of delivery post partum haemorrhage is common and after delivery that is during puerperium thromboembolism is a common complication. To minimize the complication, protocol should be there to evaluate the platelet functions during pregnancy and puerperium.

INTRODUCTION

Platelets have a pivotal role in the initial defense against insult to the vasculature and are also recognized of critical importance in the acute care settings of percutaneous coronary intervention and cardiopulmonary bypass. In these environments both platelet count and function may be markedly compromised. Unfortunately, current assays to evaluate the parameters of platelet count and functionare of limited utility for bed-side testing. Moreover, it is suggested that there may be significance (Evaluation of a BED-SIDE Platelet Function Assay). During normal pregnancy the haemostatic balance changes in the direction of hypercoagulability, thus decreasing bleeding complications in connection with delivery, on the other hand increases the risk of thromboembolic phenomenon. The important relationship of platelet to spontaneous haemostasis was first visualized by Hayem in (1891) and it was strengthened by Duke in (1912) who clearly demonstrated a correlation between the peripheral blood platelet count and bleeding time. From various studies it is now known that quantitative and qualitative changes in platelets play an important part in various thrombotic and haemorrhagic states. Complications like haemorrhagic and thromboembolic phenomenons are quite common during pregnancy and puerperium (Hayem 1891). However in this part of the country no systematic studies have yet been undertaken regarding the role of platelet functions in pregnancy and puerperium according to parity. To study the platelet functions two of the key tests are

1) To estimate the platelet count
2) Determination of bleeding time (Dacei *et al.,* 1994).

MATERIALS AND METHODS

The study was conducted in Department of Physiology, Assam Medical College, Dibrugarh, Assam. The 50 nos. of randomly selected third trimester pregnant cases and the same patients were enrolled in puerperium were from the department of obst and gynae, Assam Medical College, Dibrugarh, Assam. For control 50 nos of healthy female of same age group were enrolled. For both cases and control the age group is 18 to 35 years. The cases were taken from both primipara and multipara women. The cases having high blood pressure, oedema, anaemia, albuminurea, and abnormalities in cardiovascular, respiratory and urinary system were excluded. In the study to look for the Platelet functions quantitative estimation of platelet count and bleeding time were done. Platelet count was done by Brecher and Cronkite method (Brecher and Cronkite 1950). Normal platelet count was 1.5 to 3 lacs / cumm of blood. Bleeding time was carried out by Dukes method (Duke, 1912). Normal Bleeding time was 2.5 to 9.5 minutes.

The data was analyzed by Microsoft excel and statistical package of social sciences (SPSS version 20.0). Mean and standard deviation were calculated and reported for

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quantitative variables. The statistical difference were tested by using one way ANOVA (Analysis of Variance). A P-value of < 0.05 was considered as statistically significant.

Ethical consideration

The necessary approval to conduct the study was obtained from ethical committee of Assam Medical College, Dibrugarh, Assam. Consent form obtained from all participants to ensure their voluntary participation.

RESULTS

The study population consist of 50 control and 50 cases in pregnancy and puerperium.

The distribution of cases and their results in pregnancy and puerperium together with the controls are summarized in Tables and Histogram 1-3

Table 1 and Histogram 1 Platelet count in control and study group

S.No.	Different stages	No.of cases	Range	Mean	SD	SE
1	Non pregnant	50	1.5—3.35	2.396	0.408	0.057
2	Pregnant in third trimester	50	1.1-2.85	2.331	0.419	0.059
3	Primi para in pregnancy	27	1.1-2.5	2.269	0.341	0.012
4	Multi para in pregnancy	23	1.1-2.43	2.403	0.493	0.021
5	Puerperium	50	2.24 -3.84	3.26	0.535	0.075
6	Primi para in Puerperium	27	2.24-3.84	3.319	0.350	0.013
7	Multi para in Puerperium	23	3.02 -3.75	3.321	0.321	0.009

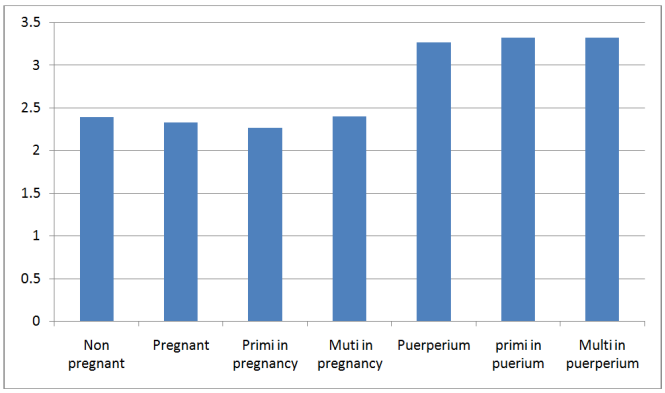

Table 2 and Histogram 2 shows the Bleeding time in cases and control

S.No.	Different stages	No.of cases	Range	Mean	SD	SE
1	Non pregnant	50	1.5-2.66	1.783	0.203	0.027
2	Pregnant in third trimester	50	1.1-2.85	1.883	0.350	0.049
3	Primi para in pregnancy	27	1.1-2.25	1.867	0.326	0.012
4	Multi para in pregnancy	23	1.1-2.43	1.923	0.332	0.014
5	Puerperium	50	1.32-2.42	1.823	0.241	0.034
6	Primi para in Puerperium	27	1.32-2.42	1.784	0.243	0.009
7	Multi para in Puerperium	23	2.6- 2.42	1.827	0.218	0.009

Histogram 2

Table 3. A, B, C, D, E, F, G, H, I Shows the results of statistical comparison of platelet functions in non pregnant, Pregnant and Puerperium.

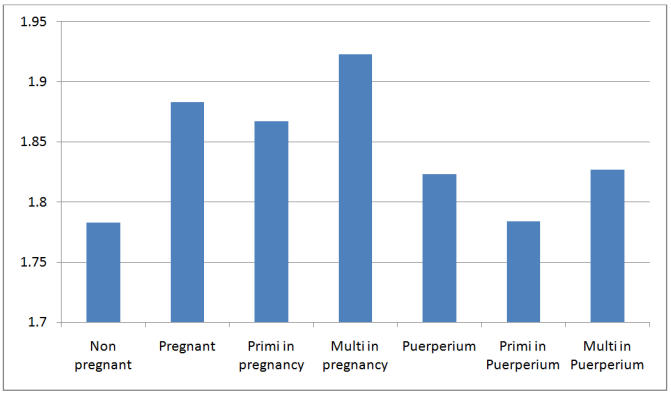

Table 3A.

Parameters	Non pregnant 50 cases mean±SD	Pregnant 50 cases mean±SD	Significance
Platelet count	2.396±0.408	2.331±0.419	>0.05
Bleeding time	1.783±0.203	1.883±0.350	>0.05

Table 3 B.

Parameters	Non pregnant 50 cases mean±SD	Primi in Pregnant 27cases mean±SD	Significance
Platelet count	2.396±0.408	2.269±0.341	>0.05
Bleeding time	1.783±0.203	1.867±0.326	>0.05

Table 3 C.

Parameters	Non pregnant 50 cases mean±SD	Multi in Pregnant 23cases mean±SD	Significance
Platelet count	2.396±0.408	2.403±0.493	>0.05
Bleeding time	1.783±0.203	1.923±0.332	<0.05

Table 3 D.

Parameters	Pregnant 50 cases mean±SD	Puerperium 50 cases mean±SD	Significance
Platelet count	2.331±0.419	3.26±0.535	<0.001
Bleeding time	1.883±0.350	1.823±0.241	>0.05

Table 3E.

Parameters	Non pregnant 50 cases mean±SD	Puerperium 50 cases mean±SD	Significance
Platelet count	2.396±0.408	3.26±0.535	<0.001
Bleeding time	1.783±0.203	1.823±0.241	>0.05

Table 3F.

Parameters	Non pregnant 50 cases mean±SD	Primi in purperium 27 cases mean±SD	Significance
Platelet count	2.396±0.408	3.319±0.350	<0.001
Bleeding time	1.783±0.203	1.784±0.243	>0.05

Table 3 G.

Parameters	Non pregnant 50 cases mean±SD	Multi in purperium 23cases mean±SD	Significance
Platelet count	2.396±0.408	3.321±0.231	<0.001
Bleeding time	1.783±0.203	1.827±0.218	>0.05

Table 3 H.

Parameters	Primi in Pregnant 27cases mean±SD	Primi in purperium 27 cases mean±SD	Significance
Platelet count	2.269±0.341	3.319±0.350	<0.01
Bleeding time	1.867±0.326	1.784±0.243	>0.05

Table 3 I.

Parameters	Multi in Pregnant 23cases mean±SD	Multi in purperium 23cases mean±SD	Significance
Platelet count	2.403±0.493	3.321±0.231	<0.01
Bleeding time	1.923±0.332	1.827±0.218	>0.05

In Table 1 and 2 and Histogram 1 and 2 shows the mean ±SD of platelet count and bleeding time in non pregnant, pregnant and in purperium in both primi and multi para. In table 1 and histogram 1 shows the mean platelet count as a whole in pregnancy is decreases than the non pregnant stat but the count is more in multipara than the primi para. Simillarly in puerperium the count is increases than the non pregnant and pregnant state and we got more platelet count in multi para than the primi para. In Table 2 and Histogram 2 shows the mean bleeding time as a whole in pregnancy is increases than the non pregnant stat but the value is more in multipara than the primi para . Simillarly in puerperium the value is increases than the non pregnant but decreases than the pregnant state and we got more mean bleeding time in multipara than the primi para in puerperium.

In Table 3-A, B, C, D, E,F, G, H,I shows the comparison of platelet functions in control and study group. Here the comparison of mean ±SD of platelet count between non pregnant and pregnant and non pregnant and primi para and multi para is statistically not significant (Table 3A, B and C). But comparison of mean platelet count with pregnant and puerperium, non pregnant to puerperium, non pregnant to primi and multi para in puerperium is statistically highly significant (Table 3 D,E,F,G). In Table 3H and I comparison between primi pregnant and primi in puerperium, multi para in pregnancy and multi para in puerperium is statistically highly significant.

In bleeding time mean ±SD comparison in control and cases statistically not significant (Table 3 A,B, D, E , F, G, H, I). But comparison between non pregnant and multi para in pregnant is statistically significant (Table 3C).

DISCUSSION

Haemrorhage, thrombosis and embolism during pregnancy, labour and puerperium take a great importance in maternal lives in this country. Role of platelet in thromboembolic phenomena, blood coagulation and haemostasis is known since long time. But not much information was found regarding the platelet function in pregnancy and puerperium according to parity. In the present study mean platelet count decreases in pregnancy than the non pregnant. It may be due to increased consumption of platelets in the utero-placental unit resulting in decreasing platelet counts (Aster, 1990; Burrows and Kelton, 1990). Present study results are similar to that of Ward *et al.* (1948) and Shaper *et al.* (1968). But platelet count is more in multi para pregnant than the primi para pregnant. This may be due to more hypervolumia in multi than in primi. No relevant data found. In our study there is increase mean platelet count in puerperium than in non pregnant and pregnant. Platelet count is slightly more in multi para puerperium than in primi para in puerperium. But there is no available study regarding platelet count in pregnancy and puerperium according to parity.

A retrospective epidemiological study by Simpson *et al.* (2001) 6 from Norhth West Thames region — 10 years London perinatal database 1988–1997 and Ray *et al.* (1999) 9 meta analysis of the period of risk of deep vein thrombosis in pregnancy and puerperium suggested postpartum as the highest risk period. In the present study the bleeding time found to be prolonged in pregnancy than the non pregnant state. Statistically the values are significant. It correlate with the platelet count in the study. Again in the study mean bleeding time in primi and multi pregnancy is more than nonpregnant. But comparison between primi pregnant and nonpregnant statistically notsignificant. Comparison between non pregnant and multi pregnancy is statistically significant. There is no other significant findings in this study. This may be due to decrease amount of anti coagulant in the circulation play a role in increasing bleeding time.

Conclusion

So from the present study it has seen that consistant change in platelet functions are found in pregnancy and puerperium. So, establishment of accurate etiological diagnosis and individualized management are required to obtain optimum outcome in clinical condition. Since in the study the mean values are more in multi than in primippara in pregnancy and puerperium, so they are at high risk for thromboembolic and bleeding disorder.

REFERENCES

Aster RH. 1990. Gestational thrombocytopenia. A plea for conservative management. *N. Engl. Med.,* 323:264–266.

Brecher, G., Cronkite, E.P. 1950. Morphology and enumeration of human blood Platelets, *J. Apple. Physiol.,* 3: 365.

Burrows RF, Kelton JG. 1990. Thrombocytopenia at delivery: a prospective survey of 6715 deliveries. *Am. J. Obstet. Gynecol.,* 162:731–734.

Dacei, Sir John V., Lewis S.M., 1994. Investigation of a suspected disorder of platelet formation, inharited OM Acquired, *Practical Haematology*, 8th edition, 319

Duke, W.W. 1912. The pathogenesis of purpura haemorrhagica with special reference to the part played by the blood platelets; *Amch, Intern. Med.,* 10:445.

Duke, W.W. 1912. The pathogenesis of purpura haemorrhagica with special reference to the part played by blood Platelets; *Amch, Inter. Med.,* 10:445.

Evaluation of a BED-SIDE Platelet Function Assay: Performance and Clinical Utility.

Shaper, A.G. Kear, J., Macintosh, D.M., Kyobe, J. and Ujama, 1968. The platelet count, platelet adhesiveness and aggregation and mechanism of fibrinolytic inhibition in pregnancy and puerperium, *J. Obst. and Gynae. Brit. Cwlth.,* 75;443.

Ward, C.V Mac Arthur, J.L. 1948. Blood platelets studies during pregnancy and Puerperium; *Am. J. Obst. and Gynae.,* 55;600-608.

Simpson EL, Ladwrenson RA, Nightingale AL, Farmer RDT. Venous thromboembolism in pregnancy and the puerperium: incidence and additional risk factors from a London perinatal database. *BJOG,* 2001;108:56–60

Ray JG, Chan WS. CME review article. *Obstet Gynecol Surv.,* 1999;54:265–71.

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