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THE HEMOSTATIC MECHANISMS IN PIH

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ABSTRACT:

INTRODUCTION: Pregnancy induced hypertension (PIH) is a major complication of pregnancy and is one of the major causes of maternal mortality and perinatal complications. Changes in coagulation system in established preeclampsia are well documented. Out of all haematological changes that occur in preeclampsia, thrombocytopenia is the most common.[2] the parameters studied in the present study support the aetiopathogenesis of clinical manifestations & help to reduce further fetal and maternal complications.**AIMS & OBJECTIVE:** To assess the association of bleeding time, Clotting time and Platelet count withPIH.**MATERIALS AND METHODS:** 30 diagnosed cases of preeclampsia blood pressure > 140/90mmHg & proteinuria >300mg/l in 24hour after 20 weeks of gestation. 30 age, parity and gestation matched normotensive pregnant women subjects were taken for the study. Bleeding time, Clotting time and Platelet count were measured.Statistical analysis was done by using student't' test between the two groups. A p-value less than 0.05 were considered as significant.**RESULTS:** Bleeding time and clotting time were prolonged in PIH but was not statistically significant. The platelet count is decreased in PIH which is statistically significant**CONCLUSION:** Prolonged bleeding time may be due to generalized vasoconstriction. Prolonged Clotting time was due to further depression of fibrinolytic activity. The lower platelet count in preeclampsia is associated with abnormal activation of coagulation system & is believed to reflect increased platelet consumption.

KEY WORDS: Pregnancy induced hypertension (PIH) Bleeding time (BT), Clotting time (CT) , Platelet count

INTRODUCTION:

Quality of life for mother and newborn has become our most important concern now days.PIHis a poorly understood condition of human pregnancy, which can affect multiple organs and is a leading cause of maternal mortality worldwide[1]. PIHis a clinical manifestation characterized by hypertension, proteinuria and oedema that occurs after 20th week of pregnancy[2]. It is suggested that PIHis associated with intervillous and spiral artery thrombosis, vascular endothelial damage

and abnormalities of coagulation, leading to inadequate maternal, fetal and placental circulation[3].The most common cause is uteroplacental under perfusion leading to decreased fetoplacental prostacyclin. Elevated maternal thromboxane/prostacyclin ratio leads to increased sensitivity to Angiotensin II, arterial vasoconstriction and subsequent elevation of blood pressure. Intravascular
Coagulation Changes in coagulation system in established preeclampsia are well documented[4].Out of all the haematological changes that occur in pre-eclampsia and eclampsiathrombocytopenia is the most common haematological abnormality found [5].The degree of thrombocytopenia increases with the severity of disease. Lower the platelet count, greater are maternal and foetal mortality and morbidity[6]. Very few studies are present on this ground in our country. Therefore the present study is designed to assess the association of Bleeding time, Clotting time , Platelet count with PIH.

MATERIALS AND METHODS: The present study was carried out at Navodaya Medical College and Research centre, Raichur.The study and its conduct were cleared by the human ethical clearance committee.30 diagnosed cases of PIH blood pressure > 140/90mmHg & proteinuria >300mg/l in 24hour after 20 weeks of gestation. The diagnosis was made on brief clinical history, B.P. and urine examination for protein.30 age (20 to 30 yrs), parity and gestation matched normotensive pregnant women subjects were taken for the study. Detailed history was taken to exclude anaemia and high risk factors like cardiovascular diseaseand diabetes. Special attention was given to exclude hemorrhagic disorders, renal and hepatic disorder and history of drug intake, which can affect platelet count. Blood pressures were measured bysphygmomanometer. After obtaining informed written consent from the study subjects and maintaining all aseptic precautions, 3 ml of blood was drawn from ante-cubital vein and collected in an EDTA containing tube.The haematological investigations were performed on a fully automated Orphee Mythic- 18 three part differential cell counter.

OBSERVATION & RESULTS:

Statistical Analysis: Was performed by using computer based software, Statistical Package for Social Science (SPSS) for Windows version 14.0 Mean values of different parameters were compared to determine the differences between two groups by using Student's unpaired't' test. A p-value less than 0.05 were considered as significant.
Maternal age and body mass index (BMI) were not significantly different between the groups ($p>0.05$). Systolic and diastolic blood pressures were significantly higher in PIH groups as compared to healthy normal pregnant women ($p<0.001$).Bleeding time and clotting time were prolonged in PIH but was not statistically significant. The platelet count is decreased in PIH which is statistically significant.

Table1. Bleeding time, Clotting time ,Platelet count of normal pregnant women & PIH patients

Parameters	Normal pregnancy	PIH	Mean difference	95% CI of difference	t-value	p-value
Bleeding time	2.49 ± 0.18	2.55 ± 0.27	0.06	-0.04 – 0.16	1.18	0.24NS
Clotting time	5.17 ± 0.84	5.48 ± 0.95	0.31	-0.15 – 0.77	1.34	0.18NS

Platelet count lac/mm	2.41 ± 0.47	1.93 ± 0.38	0.48	0.26 – 0.7	4.35	P<0.001

NS- Not significant.

DISCUSSION:A transient mild thrombocytopenia is seen due to increased platelet consumption during pregnancy[7]. Thrombocytopenia is found in approximately 6% of pregnancies[8] and most common cause of thrombocytopenia in pregnancy is preeclampsia and eclampsia[9].A continuous decline in platelet count as pregnancy advances was shown by Fay et al (1983). Pitkin R.M., Whittle D.L.(1979) indicated that there is possibility of platelet hyper destruction during pregnancy. This together with hemodilution and platelet trapping results in decreased platelet count[10].There is increasing evidence that abnormal enhancement of coagulation activity is involved in the pathogenesis of PIH[11]. Although the pathogenesis of thrombocytopenia in preeclampsia is not clear, but it is suggested that it may be due to endothelial damage and the peripheral consumption. The life span of platelet reduced to 3-5 days and the altered platelet membrane accelerates its aggregation and destruction[12]. The results from our study concluded that preeclamptic groups as compared and normal pregnant groups showed significantly lower platelet count with the statistical difference of p<0.001. These results were in consistent with the results given by S. Mohapatra et al[13]and Mindora Onisai, Ana-Maria Vladareanu, Horia Bumbea et al[14].However, Kulkarini and Sutariadid not observe any significant difference in respect to platelet count in their study[15].The same results were shown by Mathur et al (1980), Keehan and Bell (1957) .They also observed decrease in platelet count their study due to increased consumption and destruction of platelets[16,17]. Thrombocytopenia observed in Eclampsia was attributed to increased platelet adhesiveness by McKay et al (1964)[18]whereas persistent impaired platelet disaggregation was shown by Howie et al (1971)[19].The Bleeding time showed an increase but it was not statistically significant. The increase observed was may be due to generalized vasoconstriction. [Dube et al(1975), Talib et al (1993)] The increase is always associated with thorombocytopenia[20,21]. Kelton et al (1985) reported same finding concluding that the increase may be due to impaired Thromboxane synthesis. Increased Bleeding time with thrombocytopenia may alter the coagulation process. [Pritchard et al (1984)]The study showed increase in Clotting time which was not statistically significant[22]. Bellar et al (1977)showed the consistent increase in Clotting time with increase in severity of disease [23].Distinguishing PIH from other causes of abnormal screening results would aid doctors in the diagnosis and prompt treatment of their patients.These findings suggest that there is an excessive hypercoagulable state in PIH and are involved in pathogenesis of the condition Therefore, Platelet count may be used as simplest, cheapest and earliest indicator of PIH.

CONCLUSION & SUMMARY: The Bleeding time in our study was seen to be increased but not to statistically significant level. Prolonged bleeding time may be due to generalized vasoconstriction. Prolonged Bleeding time is associated with thrombocytopenia so it may be due to impaired synthesis of thromboxane. The Clotting time was also seen to be increased but not to statistically significant level. Prolonged Clotting time was due to further depression of fibrinolytic activity. Accumulation of fibrinogen derivatives and alterations in the clotting mechanisms also contribute to the increase. The lower platelet count in preeclampsia is associated with abnormal activation of coagulation system & is believed to reflect increased platelet consumption, decreased platelet life span, decreased prostacycline synthesis &

immunological mechanisms. The information of the present study might enrich the knowledge of clinician for early identification of preeclampsia. This is important for management of both PIH mother and the newborn.

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