



A STUDY OF COAGULATION PROFILE IN SEVERE PREECLAMPSIA & ECLAMPSIA AND ITS FETOMATERNAL OUTCOME

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ABSTRACT **BACKGROUND:** The assessment of coagulation parameters in patients with eclampsia or pre eclampsia may be important to help diagnose the severity of the disease and predict the outcome.

AIM: To study coagulation profile changes in severe preeclampsia and eclampsia and its relation to the fetomaternal outcome.

METHODS AND MATERIALS: Coagulation parameters which consisted of BT, CT, Platelet Count, PT, aPTT and D-dimer levels were done in 150 women with severe preeclampsia or eclampsia.

RESULTS: There was a statistically significant association between platelet count, d-dimer levels and severity of preeclampsia. There was also significant association of coagulation parameters with maternal outcomes.

SUMMARY AND CONCLUSION: The coagulation parameters, especially Platelet count and d-dimer can be used as early indicators for the assessment of severity of cases with hypertensive disorders of pregnancy.

KEYWORDS : Severe preeclampsia; Eclampsia; Platelet Count; D-dimer.

INTRODUCTION

The basic pathology of preeclampsia is endothelial dysfunction, poor placental and vasospasm of vessels along with alteration of hematological profile of which thrombocytopenia is the most common.

Normal pregnancy is a hypercoagulable state due to elevation of most of the coagulation factors and reduced anticoagulant activity. In hypertensive disorders of pregnancy, there is an accentuation of hypercoagulable state as a result of injury to the endothelium. Coagulation profile studied in hypertensive disorders of pregnancy is helpful in assessing the severity of coagulation abnormalities at earlier stage, prior to the occurrence of complications like HELLP Syndrome, DIC and cerebrovascular complications and hence prevent them by early intervention..

METHODOLOGY

This study was conducted in Severe preeclamptic & Eclamptic women admitted under the hospitals allied to Bangalore Medical College & Research Institute during the period of Nov 2017 to May 2019.

Blood samples were collected for the estimation of Platelet count, PT, aPTT, D-dimer. About 3ml of blood was drawn under aseptic precautions in a Sodium citrate vacutainer for PT, aPTT, D-dimer and in EDTA vacutainer for Platelet count. Estimation was done using a fully automated biochemical analyzer. Bleeding time was estimated by Dukes method and clotting time by Wright's capillary tube method.

Data was entered into Microsoft excel data sheet and was analyzed using SPSS 22 version software. The unpaired "t" test was used for comparing the mean levels of the coagulation parameters with fetal and maternal outcomes to be studied. p value < 0.05 was considered statistically significant.

RESULTS

A total of 150 subjects were included in this study of which 120 were severe pre eclampsia (Group SPE) and 30 patients were eclampsia (Group E).

The mean values of age, gestational age, systolic B.P. and Diastolic B.P. in each of the Eclampsia group, Severe Preeclampsia group and the total patients is shown in Table 1.

Table 1: Mean Values Of Age, Gestational Age, SBP And DBP

	HDP TYPE		TOTAL PATIENTS
	E	SPE	
Age(years)	23.10±3.325	23.47±4.286	23.39±4.10
Gest. age(weeks)	34.37±3.211	34.65±3.345	34.59±3.31
Systolic B.P. (mmHg)	159.93	157.87	158.28±11.56
Diastolic B.P.(mmHg)	110.8	105.52	106.57±8.27

There was a statistically significant association between the platelet count, d-dimer levels and the severity of preeclampsia. Platelet count showed inverse relationship and D-dimer values were prolonged with severity of preeclampsia as depicted in table 2.

Table 2: Comparison Of Coagulation Profile In Eclampsia & Severe Pe Groups

PE	ECLAMPSIA	SEVERE PREECLAMPSIA	P-VALUE	SIGNIFICANCE
BT(sec)	213.97±30.5	190.29±30.29	>0.05	Not significant
CT(sec)	320.50±75.8	321.17±61.56	>0.05	Not significant
Platelet count (lacs/mm ³)	1.72±0.91	2.21±0.79	<0.001	Significant
PT(sec)	9.68±0.84	10.05±2.01	>0.05	Not significant
aPTT(sec)	25.55±2.45	26.62±4.74	>0.05	Not significant
d-dimer (mcg/ml)	1.95±0.9	1.35±0.48	<0.001	Significant

The mean values of coagulation profile in the study are shown in table 3.

Table 3: Mean Values Of Coagulation Parameters

COAGULATION PARAMETER	MEAN VALUE
BT	195.03±31.69 sec
CT	321.03± 64.38 sec
Platelet count	2.11 ± 0.84 lacs/mm ³
PT	9.98 ± 1.89 sec
aPTT	26.41 ± 4.40 sec
D-dimer	1.47± 0.64 mcg/ml

Table 4 shows the different coagulation parameters and their association with fetomaternal outcome in patients of pre eclampsia and eclampsia. The numerical values in the parentheses shown in the table are mean levels of the coagulation parameters in the corresponding outcome studied.

Table 4: Association Of The Coagulation Parameters With The Fetomaternal Outcomes

OUTCOME	BT (sec)	CT (sec)	PLATELET COUNT (lacs/mm ³)	PT (sec)	APTT (sec)	D-DIMER (mcg/ml)
HELLP	-	-	✓ (0.62±0.24)	✓ (10.32±1.17)	-	✓ (1.65±1.00)
CNS INVOLVEMENT	-	-	✓ (3.05±0.21)	-	-	-
FEBRILE ILLNESS	-	-	✓ (2.80±1.41)	-	-	-

PPH	-	-	✓ (1.57±1.00)	✓ (14.13 ±7.99)	✓ (34.17± 15.02)	✓ (1.72±1.22)
BLOOD TRANSFUSION	-	-	✓ (1.41±1.20)	✓ (10.72 ±4.05)	-	✓ (1.63±0.94)
MATERNAL MORTALITY	-	-	-	-	-	-
PRETERM DELIVERY	✓ (197.58 ±30.09)	-	-	-	-	-

✓=Significant association(p<0.05)

The only significant association of the coagulation parameters with the fetal outcomes studied was that between Preterm delivery and BT levels.

DISCUSSION

The results of the present study is well correlated with other studies like Sogani S et al¹, Chauhan et al², Sridhar et al³ and Naaz et al⁴.

On analysis of Bleeding Time, many authors found no correlation of Bleeding Time with severity of preeclampsia and found prolonged BT only in cases of established DIC. In the present study, mean BT value was 195.05±31.69 seconds. In severe preeclampsia group it was 190.29±30.29 seconds and in eclampsia group it is 213.97±30.50 seconds. Though the values lie within the normal range, there is increasing trend from SPE to eclampsia which is similar to the results of Upadhyaya R et al⁵, 198.11±52.84 in SPE group and 209.31±65.34 in the eclampsia group. BT was significant when the subgroups of the study were compared with each other (p<0.05) indicating that there was significant rise in the BT levels with increasing severity of the disease.

Mean platelet count in this study was 2.11±0.84 lacs/cumm. In severe preeclampsia, it was 2.21±0.79 lacs/mm³ and in eclampsia group, it was 1.70±0.90 lacs/mm³. Various studies reported the functional abnormalities of platelets in some women with preeclampsia. This platelet function abnormality along with decreased platelet count may be one of the end organ manifestations of preeclampsia and may constitute an additional risk to patients with preeclampsia. Howie et al⁶ found platelet count in normal pregnant women as 215,000/cumm and in mild preeclampsia as 168,000/cumm (p<0.01) and 142,000/cumm (p<0.01) in severe preeclampsia, and explained the reduced platelet count due to consumption during intravascular coagulation. Bonnar et al⁷ showed platelet count of 203±60 x 10³/cumm in control group and 140±39 x 10³/cumm, a highly significant thrombocytopenia (P<0.01) in severe preeclampsia. Giles et al⁸ found platelet count in control-286±68.7 x 10³/cumm, mild preeclampsia 220±62 x 10³/cumm (p<0.05) and 155±69 x 10³/cumm (p<0.01) in severe preeclampsia.

Pritchard et al⁹ noted no significant change in platelet count in mild preeclampsia but significantly decreased count in eclampsia when compared with normal pregnant control. Kulkarni et al¹⁰ found increase in severity in thrombocytopenia with increasing severity of pre-eclampsia. Our findings were in agreement with other studies mentioned above which showed a decreasing trend from group SPE to Eclampsia.

Preeclampsia is characterized by the deposition of fibrin in the walls of small blood vessels. D-dimer is used as a marker for degradation of fibrin in vivo. Hence, D-dimer can be used as a useful indicator for the assessment of severity of DIC. Mean D-dimer value in the study was noted to be 1.47±0.64 mcg/ml. That in E group was 1.96±0.91 mcg/ml and in SPE group it was 1.35±0.49 mcg/ml. There was also a significant association between the D-dimer levels in the 2 groups. Similar results were also reported by KucukgozGulec U et al¹¹ where D-Dimer levels were significantly higher in study group than the control group and it was also significantly higher in the patients with severe preeclampsia than mild preeclampsia.

CONCLUSION

Pre eclampsia and eclampsia is a common cause of maternal morbidity and mortality. Amongst the maternal complications accompanying preeclampsia and eclampsia, coagulation abnormalities are one of the commonest complications.

The results from the present study suggest that the values of different

parameters in the Coagulation Profile denote the severity of the disease to some extent. There was a statistically significant association between the platelet count, D-dimer levels and severity of preeclampsia. Platelet count showed inverse relationship and D-dimer values were prolonged with severity of preeclampsia. Hence, the coagulation parameters, especially Platelet count and D-dimer can be used as an early indicator for the assessment of severity of preeclampsia and can be used to monitor its progression. Early assessment of severity of PIH is necessary to prevent complications like HELLP syndrome and DIC. This study also showed significant association of coagulation parameters with maternal outcomes. The levels of these parameters can be very useful markers to identify the occurrence of the complications of preeclampsia in early pregnancy and help in the management of these women. With these tests, coagulation disorders of preeclampsia and eclampsia can be detected which will be helpful in treating the patients who probably may go for DIC.

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