

Evaluation of Coagulation Profile in Pregnancy Induced HypertensionAnamika Gaurav¹, Sumit Kumar Suman², Puja Mahaseth³¹Senior Resident, Department of Obstetrics and Gynaecology, Darbhanga Medical College & Hospital, Laheriasarai, Bihar²M.D. (Medicine), RML, New Delhi, D.M.(Gastro), Gandhi Medical College, Hyderabad³Associate Professor, Department of Obstetrics and Gynaecology, Darbhanga Medical College & Hospital, Laheriasarai, Bihar

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Abstract:

Background: Pregnancy induced hypertension (PIH) is one of the most common causes of both maternal and neonatal morbidity and associated with adverse pregnancy outcomes. Profound changes in coagulation and fibrinolytic system occur during normal pregnancy causing hypercoagulable state. Early identification of high risk women and monitoring derangements in their coagulation system are surely pivotal in the prevention of complications. Hence, this study was undertaken to compare the coagulation profile in pre-eclamptic and eclamptic patients with normotensive pregnant patients. Hypertension is one of the common medical complications of pregnancy and contributes significantly to maternal and perinatal morbidity and mortality. Aim of this study to evaluate the coagulation profile in pregnancy induced hypertension.

Methods: Present study was carried out in the Department of Obstetrics and Gynaecology, DMCH, Laheriasarai, Bihar on 100 PIH cases from July 2023 to December 2023. Coagulation profile (PT, aPTT, INR and D-dimer) was done in all cases and values were correlated with the severity of PIH.

Results: Total of 100 cases were included in the study. 32 were mild GH, 17 cases were severe GH, 35 cases were mild pre-eclampsia and 16 cases were in severe pre-eclampsia group. Prolonged PT, aPTT and D-Dimer was seen in 15 cases, 42 cases and 38 cases respectively. In our study we observed increased mean aPTT of 31.61 ± 2.89 and increased D-Dimer of 0.34 ± 0.31 in severe pre-eclampsia patients. Hence we emphasize that raised aPTT, D-Dimer are alarming signs for aggressive treatment.

Conclusion: Raised aPTT and D-dimer are fairly good indicator of severe preeclampsia and needs aggressive treatment.

Keywords: Hypertension, preeclampsia, eclampsia, HELLP Syndrome, D-Dimer.

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Introduction

Hypertension is one of the most common medical complications of pregnancy. It contributes significantly to maternal and perinatal morbidity and mortality. Hypertension is a sign of an underlying pathology which may be pre-existing or appear for the first time during pregnancy.[1] Hypertension affects 7-15% of all pregnancies. It is associated with 16 % of all maternal mortality and 20% of all perinatal mortality in India.[1,2]

Pregnancy induced hypertension (PIH) is defined as hypertension that develops as the direct result of the gravid state. It includes, i) Gestational hypertension, ii) Preeclampsia, iii) Eclampsia.[1,2]

Hematological abnormalities such as thrombocytopenia and decrease in some plasma clotting factors may develop in preeclamptic women.[3]

In pregnancies with preeclampsia coagulation cascade is generally activated. Preeclampsia is a highly thrombotic and pro-coagulant state with platelet

activation and thrombin and fibrin formation. About 20% of patients have altered coagulation.[4]

Material and Methods

The study was carried out in the Department of Obstetrics and Gynaecology, Darbhanga Medical College and Hospital, Laheriasarai, Bihar from July 2023 to December 2023. One hundred cases diagnosed as PIH with Blood Pressure of $\geq 140/90$ mm of Hg detected after 20th weeks of gestation were included in the study. Clinical details were collected from all cases. The cases with pre-existing hypertension and associated co-morbid diseases such as diabetes mellitus, auto immune disorders, ITP, neoplastic diseases, heart diseases and cases on anti-coagulants were excluded from the study. After obtaining consent, under aseptic precaution, venous blood was collected in sodium citrate vacutainer tube. Sample was tested for

coagulation profile i.e. PT, aPTT, D-Dimer in fully automated coagulation analyser (CA-1500). PIH cases were classified in to following categories :

- A. Gestational hypertension. 1) Mild gestational hypertension, 2) Severe gestational hypertension.
- B. Pre-eclampsia. 1) Mild pre-eclampsia, 2) Severe pre-eclampsia.

The recorded data was compiled and entered in a spreadsheet (Microsoft Excel) and then exported to data editor of SPSS Version 20.0 (SPSS Inc., Chicago, Illinois, USA). Continuous variables were expressed as Mean \pm SD and categorical variables were summarized as frequencies and percentages.

Analysis of variance (ANOVA) was employed to compare coagulation profile in different categories of PIH. A P-value of less than 0.05 was considered statistically significant.

Results

One hundred cases diagnosed as PIH were analysed for coagulation profile. Of 100 cases majority i.e. 36% of the patients were of the age group 25-30 years. (Table-1) The age of the youngest patient was 20 years and that of oldest was 40 years. 25 to 30 years is the commonest age group for gestational hypertension (GH), both mild (15cases) and severe (7 cases). An equal number of severe GH was also seen in the 26 to30 age group. Mild and severe pre-eclampsia was more frequent in the 26 to 30 age group, (16 and 8 cases respectively). This probably indicates that severity of complications increases with the age of the patient. (Table-2)

Table 1: Age distribution of study patients

Age (years)	No. of cases	Percentage
20-25	17	17%
25-30	36	36%
30-35	31	31%
35-40	16	16%
Total	100	100%

Total number of patients in this study were 100 with maximum number of patients in age group of 25 to 30 years followed by patients in age group of 30 to 35 years. This result showed that PIH increases with increasing age among women(67% in age 25 and above).

Table 2: Showing age wise distribution of various categories of PIH cases

Age (years)	Mild GH		Severe GH		Mild Preeclampsia		Severe Preeclampsia	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
20-25	3	9.4%	3	17.6%	7	20.0%	2	12.5%
25-30	15	46.9%	6	35.3%	16	45.7%	8	50.0%
30-35	11	34.4%	7	41.2%	10	28.6%	4	25.0%
35-40	3	9.4%	1	5.9%	2	5.7%	2	12.5%
Total	32	100%	17	100%	35	100%	16	100%

This table is showing that among 100 patients mild gestational hypertension (46.9%) was in age group of 25 to 30 years; severe gestational hypertension (34.4%) in 30 to 35 years age group; mild pre-eclampsia (45.7%) in 25 to 30 years age group and severe pre-eclampsia (50%) in age group in 25 to 30 years.

Table 3: Showing D-Dimers in various categories of PIH cases

D-Dimer	Mild GH		Severe GH		Mild Preeclampsia		Severe Eclampsia	
	No.	Percentage	No.	Percentage	No.	Percentage	No.	Percentage
<0.3	19	59.4%	8	47.1%	25	71.4%	10	62.5%
0.3-1	13	40.6%	9	52.9%	10	28.6%	6	37.5%
Total	32	100%	17	100%	35	100%	16	100%

This table shows value of aPTT increases with severity of PIH with maximum value in severe preeclampsia (31.61 \pm 2.89); also D dimers were in in higher range in severe preeclampsia as compared

to others. So APTT and D dimer can predict the severity of PIH and helps us to plan and manage patient accordingly to decrease maternal and fetal morbidity and mortality.

Table 4: Comparison of coagulation profile in different categories of PIH

Variable	Mild GH	Severe GH	Mild Preeclampsia	Severe Preeclampsia	P-value
Age(years)	25.8 \pm 2.41	26.3 \pm 3.19	25.4 \pm 2.87	25.7 \pm 3.24	0.997
Gestationalage(weeks)	36.2 \pm 3.65	35.3 \pm 3.19	36.7 \pm 2.72	35.5 \pm 3.41	0.991
PT	12.43 \pm 1.93	13.41 \pm 1.32	13.09 \pm 2.05	12.97 \pm 1.97	0.989
APTT	25.92 \pm 3.07	26.67 \pm 2.71	28.82 \pm 3.23	31.61 \pm 2.89	0.685
D-Dimer	0.29 \pm 0.46	0.32 \pm 0.27	0.26 \pm 0.29	0.34 \pm 0.31	0.876

Discussion

Preeclampsia is an idiopathic multisystem disorder specific to human pregnancy and the puerperium.[3] Hematological abnormalities such as thrombocytopenia and decrease in some plasma clotting factors may develop in preeclamptic women.[4] Subtle changes suggesting disseminated intravascular coagulation (DIC) is one of the serious outcome of preeclampsia. Thus, coagulation testing is to be done in these patients to rule out DIC[4,7] and HELLP (hemolysis, enzyme elevation and low platelet) syndrome. From the historical point of view, earlier it was stated that only serial measurements of platelet count was adequate for intrapartum screening.[8] Later, combination of platelet count and aPTT[10] platelet count and liver function tests[9], platelet count and lactatedehydrogenase[7], platelet count and antithrombin[11] were suggested for early detection and screening of the patients with preeclampsia. It was observed that abnormal PT, aPTT and fibrinogen levels with platelet counts of less than $100,000/\text{mm}^3$ were seen in preeclampsia. So the physician can safely follow the platelet counts of the patients with severe preeclampsia.[8] In our study a total of 100 PIH cases referred to the department of pathology from ANC clinic were evaluated for coagulation profile. Majority of the cases were in the age group of 26-30 years with mean of 28 ± 3.02 , which is comparable to Onisai et al study where they observed that the mean age of PIH was 29.8 years.[12] In the present study PT was prolonged in 5% which is in concordance with the study conducted by FitzGerald et al[13]. aPTT was prolonged in 20% of PIH cases in our study as compared with other studies such as FitzGerald et al. wherein 25% of cases had a prolonged aPTT. However Onisai et al observed no change in PT and aPTT in their study.[12] In the present study D-Dimer levels increased in 38% of PIH cases which is in concordance with the study conducted by Takao et al.[14]

Prolonged PT, aPTT and D-Dimer was seen in 5 cases, 20 cases and 38 cases respectively in our study and increased mean aPTT of 31.61 ± 2.89 and increased D-Dimer of 0.34 ± 0.31 in severe preeclampsia patients was noted. Hence we emphasize that raised aPTT, D-Dimer are alarming signs for aggressive treatment.

Conclusion

The coagulation parameters, especially aPTT and D-dimer can be used to monitor the progression of gestational hypertension to preeclampsia. Raised aPTT and D-dimer are fairly good indicators of severe preeclampsia and needs aggressive treatment.

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