

COMPARISON OF COAGULATION PROFILE IN PRE ECLAMPTIC AND ECLAMPTIC PATIENTS WITH NORMOTENSIVE PREGNANT PATIENTSPriyanka Chauhan¹, Usha Rawat², Vandana Bisht³, R. C. Purohit⁴**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: AIM: To compare the coagulation parameters in patients with preeclampsia and eclampsia with normotensive pregnant patients in Nainital district of Uttarakhand state. **MATERIAL AND METHODS:** From January 2012 to June 2013, coagulation indices including platelet count, prothrombin time (PT), activated partial thromboplastin time (aPTT), bleeding time (BT) and clotting time (CT) were measured in 100 patients with preeclampsia and eclampsia and compared with 100 normotensive pregnant women. The patients with coagulopathies were excluded. **RESULT:** In pre-eclampsia and eclampsia, decrease in platelet count (157.18 ± 56.66 lacs/cumm) was highly significant ($p < 0.001$). PT, aPTT and CT were normal but BT (322.46 ± 171.39 sec) was significantly prolonged ($p < 0.001$) in pre eclampsia and eclampsia patients. **CONCLUSION:** The abnormalities pertaining to coagulation parameters in hypertensive disorders of pregnancy indicate the intravascular coagulation.

KEYWORDS: Coagulation, Thrombocytopenia, Pre eclampsia, Eclampsia.

INTRODUCTION: Hypertensive disorders are the most common medical complication of pregnancy and are important cause of maternal and perinatal morbidity and mortality. Pre eclampsia is an important health issue that has to be dealt with especially in developing countries where the incidence and rates of adverse outcomes are higher. Profound changes in the coagulation and fibrinolytic system occur during normal pregnancy and it is associated with hypercoagulable state.¹ Women with pregnancy induced hypertension may develop a variety of hematological aberrations.² Out of all the haematological changes that occur in pre-eclampsia and eclampsia, thrombocytopenia is the most common haematological abnormality found.³ The other tests like prothrombin time, activated partial thromboplastin time, bleeding time and clotting time are more sensitive but expensive. It is known that an underlying coagulation abnormality increases the risk of bleeding complications. Thus, we have to use correct and necessary laboratory tests for the diagnosis of complications of hypertensive disorders of pregnancy. Hence, our study is to find out the changes that occur in the coagulation parameters in pregnancy induced hypertension as compared to that in normal pregnancy. The results may help in the better management of patients with pregnancy induced hypertension.

AIM: To compare the coagulation profile in pre-eclamptic and eclamptic patients with normotensive pregnant patients.

MATERIAL AND METHODS: The study was carried out on the patients in their third trimester of pregnancy, admitted to the maternity ward and labor room of the Obstetrics and Gynecology

ORIGINAL ARTICLE

department of Government Medical College, Haldwani. The study was done from the period of January 2012 to June 2013 including 200 patients.

1. 100 of these patients were taken as control.
2. Another 100 patients were included in the study group. These patients were diagnosed with pre eclampsia and eclampsia.

CONTROL: Normotensive pregnant patients in their third trimester of pregnancy not associated with any other complications.

The diagnostic criteria used to define pre eclampsia were:

1. 28 weeks of gestation
2. Blood pressure of 140/90 mmHg or greater when readings taken twice six hours apart.
3. Proteinuria of 1+ or greater by dipstick method in two random samples when measured 6 hours apart.

These patients were further categorized into three different categories:

MILD PRE ECLAMPSIA: Systolic blood pressure between 140 – 160 mm Hg Diastolic blood pressure between 90 – 110 mm Hg Proteinuria upto 1+.

SEVERE PRE ECLAMPSIA: Systolic blood pressure between >160 mm Hg Diastolic blood pressure >110 mm Hg Proteinuria >1+.

ECLAMPSIA: Pre eclampsia associated with seizures.

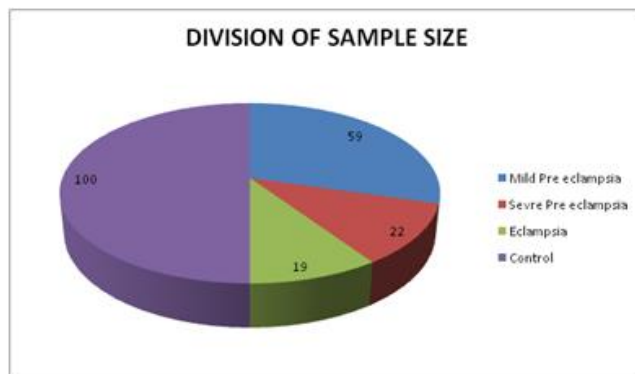
EXCLUSION CRITERIA:

1. Pre-existing medical disorders - Diabetes Mellitus
Renal disease
Any coagulopathies
Chronic Hypertension
2. Smokers
3. Multifetal Gestation
4. Age >35 years
5. Placental abruption or previa
6. Sepsis
7. Heavy vaginal bleeding

All of them were subjected to detailed history, examination and investigation with the proforma as appended. All the cases were subjected to the following coagulation parameters like Platelet count, Prothrombin time, Activated partial thromboplastin time, Bleeding time and Clotting time. Thrombocytopenia was defined as platelet count <1,50,000/mm.³ Prothrombin time and activated partial thromboplastin time were considered abnormal if they were > 13 seconds and >35 seconds respectively. Bleeding time was considered abnormal if it was more than >7.1 minutes (430 seconds) and clotting time was abnormal if it was > 10 minutes (600seconds). Statistical analysis was performed by using appropriate statistical methods.

ORIGINAL ARTICLE

RESULTS: Out of 200 patients, 100 patients were taken as control and another 100 were included in study group which comprised of 59 patients with mild pre eclampsia, 22 patients with severe pre eclampsia and 19 patients with eclampsia. 100 patients in control group were normotensive patients in third trimester of pregnancy. This is shown by a pie chart below in figure 1.



	MILD PRE ECLAMPSIA (59)	SEVERE PRE ECLAMPSIA (22)	ECLAMPSIA (19)	STUDY GROUP (100)	CONTROL (100)
Age (yrs.)	25±3.2	24±3.4	24±4.2	24±3.4	25±3.3
Parity	1.67±0.91	1.79±1.34	1.92±1.31	1.71±1.06	1.77±1.09
Period of Gestation (days)	268.11±13.51	263.01±18.55	252.2±22.2	264.5±17.39	272.78±11.005
Systolic B.P. (mmHg)	149±9.1	162±17.4	179±13.3	159±16.6	120±11.4
Diastolic B.P. (mmHg)	98.9±5.61	107±11.3	116±10.6	105±10.5	77.6±8.78

Table 1: MEAN VALUES

As shown in the Table 1, the mean age, parity and gestational age of the patients in study group was 24±3.4 years, 1.71±1.06 and 264.5±17.39 days respectively whereas it was 25±3.3 years, 1.77±1.09 and 272.78±11.005 days respectively for the control group.

	Control	Case	"t" test	P value	Significance
Platelet count	222.93±97.94	157.18±56.66	5.81	<0.001	Significant
P.T.	13.58±1.08	13.86±1.76	1.36	>0.05	Not significant
aPTT	29.31±3.39	30.42±4.53	1.96	>0.05	Not significant
C.T	358.57±180.40	391.20±165.90	0.50	>0.05	Not significant
B.T	186.60±84.92	322.46±171.39	7.08	<0.001	Significant

Table 2: COMPARISON OF COAGULATION PROFILE

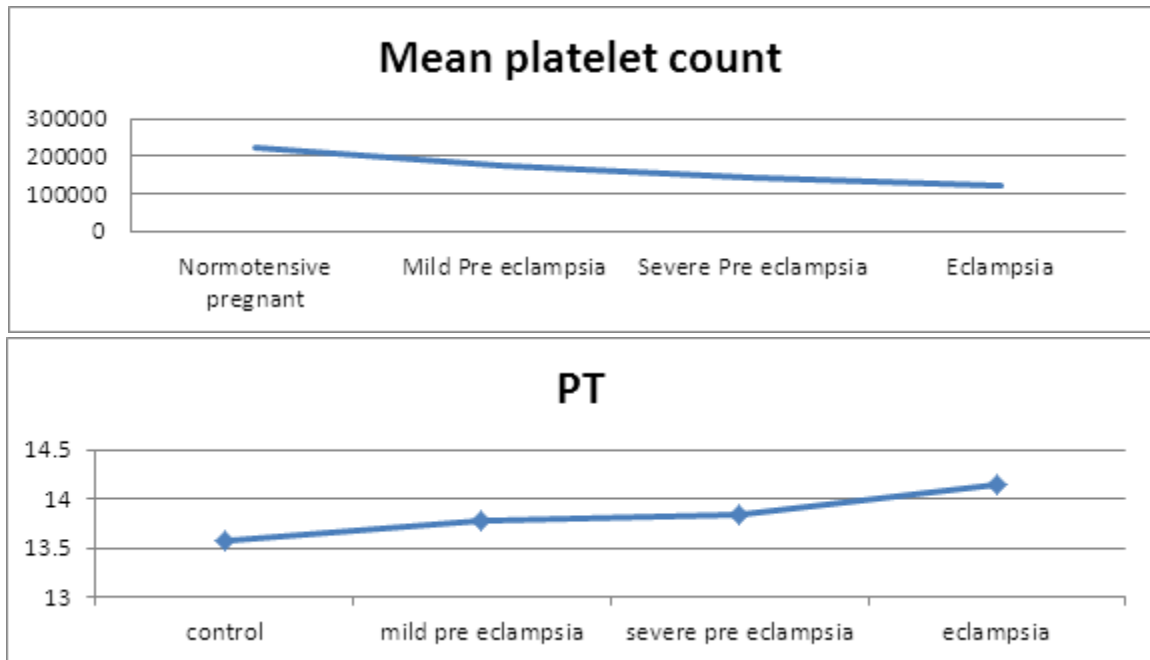
ORIGINAL ARTICLE

As depicted by the Table 2 shown above, only platelet count and bleeding time showed significant difference when control group was compared with study group while PT, aPTT and clotting time were statistically insignificant.

	Platelet count		PT		aPTT		CT		BT	
Control	222.93±97.94		13.58±1.08		29.31±3.39		358.57±180.40		186.60±84.92	
Mild pre eclampsia (1)	173.33±25.91		13.78±1.82		29.50±1.78		368.4±146.2		294.0 ±43.20	
Severe pre eclampsia (2)	145.04±23.76		13.83±1.82		30.80±1.62		374.2±124.80		324.79±59	
Eclampsia (3)	121.05±22.44		14.14±1.50		32.84±2.01		376.64±130.4		470.08±189.00	
	P value	t test	P value	t test	P value	t test	P value	t test	P value	t test
Group 1 vs. 2	<0.001	4.46	>0.05	0.11	<0.01	2.99	>0.05	0.16	<0.05	2.57
Group 1 vs. 3	<0.001	7.88	>0.05	0.98	<0.001	6.89	>0.05	0.21	<0.001	6.71
Group 2 vs. 3	<0.01	3.38	>0.05	0.58	<0.01	3.59	>0.05	0.02	<0.01	3.42

TABLE 3: COMPARISON OF COAGULATION PROFILE IN PATIENTS WITH PRE ECLAMPSIA AND ECLAMPSIA WITH CONTROL GROUP

When coagulation parameters were assessed in patients of pre eclampsia and eclampsia with increasing severity of disease (as in Table 3), there was statistically significant decrease in platelet count and statistically significant increase in aPTT and bleeding time values when subgroups in study group were compared amongst each other. This change was significant statistically implying significant coagulation parameters derangement as disease becomes more advanced.



ORIGINAL ARTICLE

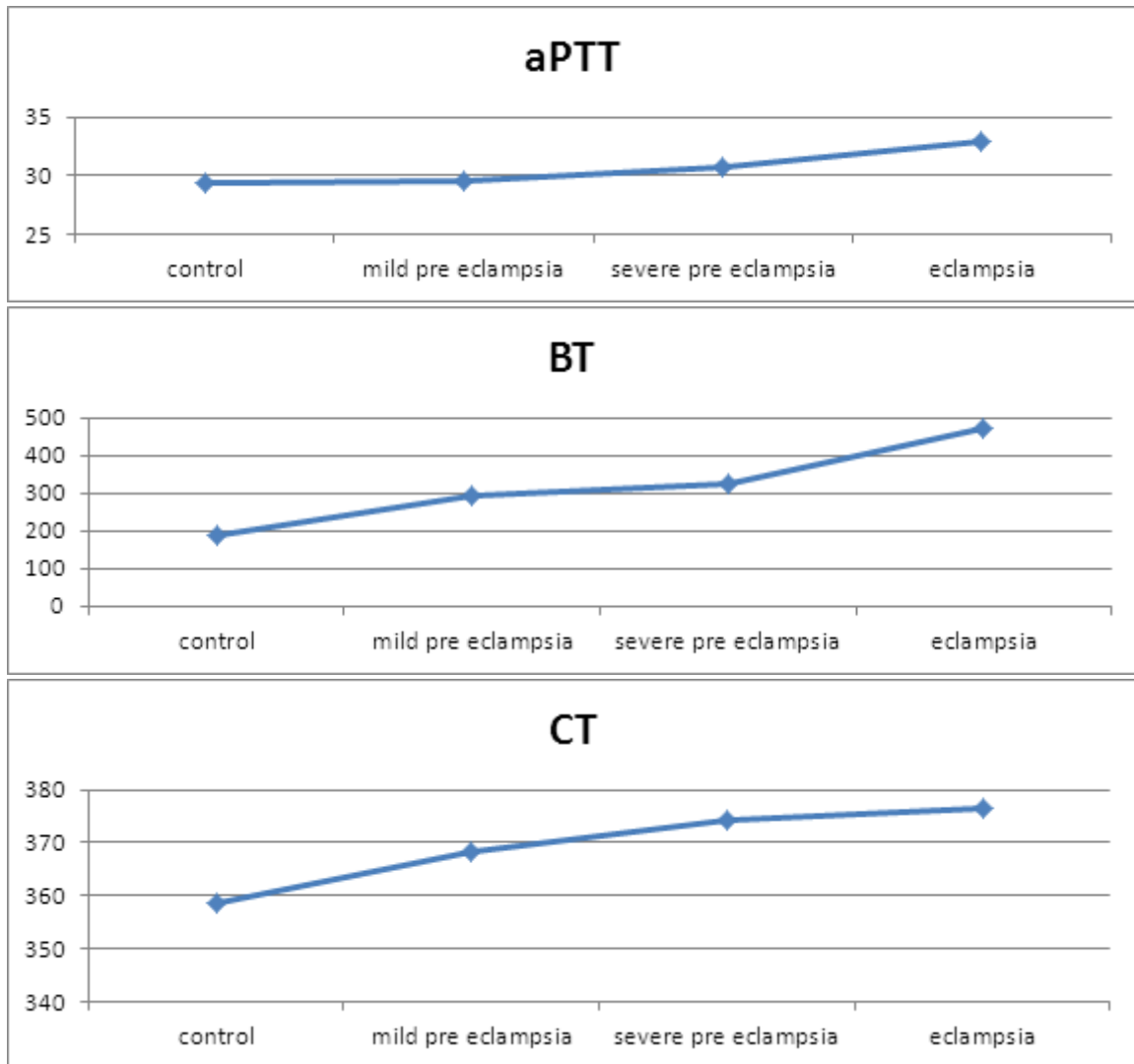


FIGURE 2: SHOWS THE COMPARISON OF DIFFERENT COAGULATION PARAMETERS BY LINE DIAGRAM

DISCUSSION: In the dawn of 21st century when we are in progress with invention and medical technologies, problems of maternal morbidity and mortality are acting as speed breaker to our roads of success. One of the most common causes is Gestational Hypertension and its fatal complications leading to Post-partum collapse, electrolyte imbalance, pulmonary edema, acute renal failure, hepatic rupture, central hemorrhage, abruptio placentae, ophthalmological problems, disseminated intravascular coagulation and hemolysis, elevated liver enzymes and low platelet count(HELLP syndrome).

All the problems can be prevented if diagnosed early. From the standpoint of prevention, pre eclampsia has remained a constant challenge to the obstetrician. Many inroads have been made in reducing the perinatal impact of pre eclampsia. This can be achieved by early diagnosis of pre eclampsia and one of the methods of early diagnosis is Assessment of Blood Coagulation Profile.

It can be seen from the present study that there is significant decrease in platelet count in pre eclampsia and eclampsia patients when compared to control group i.e.; normotensive pregnant

ORIGINAL ARTICLE

patients in their third trimester of pregnancy. The result of the present study is well correlated with other studies like Dube and Bhattacharya et al (1975)⁴, Agarwal and Buradkar et al (1978)⁵, Kulkarni and Sutaria et al (1983)⁶, Namavar Jahromi et al (2004)⁷, Mohapatra et al (2006)⁸ and many others.

In the present study, the mean value of prothrombin time (PT) is 13.86 ± 1.76 seconds while mean activated partial thromboplastin time (aPTT) is 30.42 ± 4.53 seconds. When control group is compared with study group, p value is >0.05 indicating that there is no significant change in values of PT and aPTT. This result is in accordance with the study of Antony T et al (1998)⁹, Leduc L et al (1992)¹⁰ and MP Fitzgerald et al (1994)¹¹. There is no significant change in value of prothrombin time when subgroup of cases was compared with each other. However, there is significant increase in aPTT values ($p < 0.05$) when subgroups were compared amongst themselves and when control group is compared with patients having severe pre eclampsia and eclampsia. Some studies like Namavar Jahromi et al (2005)⁷ and Jambhulkar et al (2001)¹² also showed increase in aPTT values in patients with severe pre eclampsia and eclampsia where $p = 0.005$ and $p < 0.05$ respectively with mean aPTT values 38.70 ± 10.35 and 45.4 ± 48.61 seconds respectively.

Present study showed that there is significant increase in bleeding time in study group when compared with control ($p < 0.001$). Also, it is seen that bleeding time is also significant when subgroup of cases were compared with each other. However, bleeding time is not significantly prolonged in mild preeclampsia patients but prolonged significantly in patients with severe preeclampsia and eclampsia. The result of the present study is well correlated with the results of Ramanathan J (1989)¹³, Antony et al (1998)⁹ and Burrows et al (1987)¹⁴. The increase observed was may be due to generalized vasoconstriction.

In present study, clotting time was also compared between control group and study group. A mild increase in clotting time was noticed in study group but it was not statistically significant and ($p > 0.05$). Also, when subgroup of cases were compared with each other, no significant change was noticed ($p > 0.05$). Bellar et al (1977)¹⁵ and Shete Anjali N et al (2013)¹⁶ also showed increase in Clotting time with severity of disease but it was found statistically insignificant when compared with control group. The increase is due to further depression of fibrinolytic activity, accumulation of fibrinogen derivatives and alterations in the clotting mechanisms also contribute to the increase.

CONCLUSION: Pre eclampsia and eclampsia is a common cause of maternal morbidity and mortality. Amongst the maternal complications accompanying pre eclampsia and eclampsia, coagulation abnormalities are one of the commonest complications. According to the present study, when pre eclampsia and eclampsia patients were compared with normotensive pregnant patients, it was found that the Platelet count was significantly decreased while bleeding time was found to be significantly increased in patients with pre eclampsia and eclampsia. Further studies with a large sample size and serial assessment of coagulation parameters are required to corroborate these findings and their relation with the progression and severity of pre eclampsia.

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ORIGINAL ARTICLE

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ORIGINAL ARTICLE

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