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Study of D Dimer as a predictor of severity of Gestational Hypertension

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Abstract
Objective: To study the D dimer levels as a predictor of severity of gestational hypertension.
Methodology: A Prospective observational study was performed among the Antenatal women attending the Department of Obstetrics and Gynaecology in our institution. Blood samples were collected from 150 subjects under inclusion criteria and the D Dimer levels were estimated and the same was compared with the severity of the disease. Patients who were COVID positive and who had past history of thrombotic manifestations were excluded from the study.
Results: In about 54% of the subjects evaluated, the D Dimer concentrations exceeded the normal range of more than 500 ng/dl. Higher concentrations of D Dimer levels were noted in patients with severe preeclampsia than in those with non-severe preeclampsia.
Conclusion: Maternal concentrations of D Dimer were significantly elevated in patients with severe preeclampsia than in those with non-severe disease.

Keywords: Gestational Hypertension, eclampsia, D Dimer, fibrinogen

Introduction
Gestational hypertension and its complications remains as a major problem increasing the maternal and neonatal mortality and morbidity. Preeclampsia is characterised by a systolic blood pressure of morethan or equal to 140mmhg and a Diastolic blood pressure of more than or equal to 90mmHg, on two occasions atleast 4 hours apart and proteinuria of morethan 0.3gm/24 hours collection, measured after the 20th week of gestation [1, 2]. Preeclampsia is also associated with microvascular fibrin deposition and maternal organ dysfunction.
Abnormal placentation, endothelial damage and maternal inflammatory response are the pathognomonic features of preeclampsia [3]. During pregnancy, the balance between coagulation and anti-coagulation regulates utero-placental circulation and organ perfusion. The coagulation fibrinolytic system is affected by maternal immune dysfunction and inflammatory reactions in preeclampsia [4]. D Dimer is used as a diagnostic tool for thrombotic conditions as its plasma concentrations has high negative predictive value. Hence, D Dimer has been used as a marker of production or degradation of fibrin invivo [5-7].
Gestational hypertension can progress to eclampsia, HELLP syndrome- hemolysis, elevated liver enzymes and low platelet count or disseminated intravascular coagulation. Due to poor placental perfusion, there occurs maternal organ dysfunction and fetal growth restriction [5]. No established datas were available on D Dimer levels as a predictor of gestational hypertension. Hence, through this study we will be able to establish the relationship between the levels of D Dimer and the severity of gestational hypertension and thereby helps in formulating the therapeutic strategies [8].

Methodology
The prospective observational study was conducted from November-2020 to November-2021, after obtaining approval from the Institutional Ethical committee. 150 Antenatal patients with gestational hypertension and its complications including eclampsia was selected. They belonged to either primiparous or multiparous of age group from 16-42 years, who all attended the department of Obstetrics and Gynaecology at Rajah Muthiah Medical College Hospital were included in the study. Patients with past history of thrombotic manifestations and those who are COVID positive are excluded from the study.

Written consent was obtained from all the subjects. Blood samples were collected and the D Dimer levels were estimated. Assessment was done by the researcher herself and the levels of D Dimer of each subject was analysed. D Dimer levels of more than 500ng/dl was considered significant.

Data were entered and analysed using International Business Machine (IBM), Statistical Package for Social science Statistics software -ver-2021. Chi square tests was used to determine the association between the high D Dimer levels and the severity of Preeclampsia. Variables like Age of the subjects, parity, gestational age, complications of gestational hypertension, mode of delivery and neonatal outcome were studied.

Conclusion

The 150 subjects studied were in the age group of 17 to 42 years, with mean age of 26.04 ± 5.15 years. Those with severe preeclampsia also had significantly earlier median gestational age at delivery, higher caesarean section rate of 64% and lower median birth weight of 2.16 ± 0.81kg. The mean systolic anddiastolic pressures were significantly higher. These group showed significantly higher D dimer values.

Table 1: D Dimer Values and Neonatal Outcome

D Dimer	NICU Admission	IUD	Motherside	Total
<500	27	0	45	72
501-1000	24	4	38	66
1001-1500	3	2	0	5
1500-2000	0	0	2	2
2001-2500	1	0	2	3
>2501	0	2	0	2
TOTAL	55	8	87	150

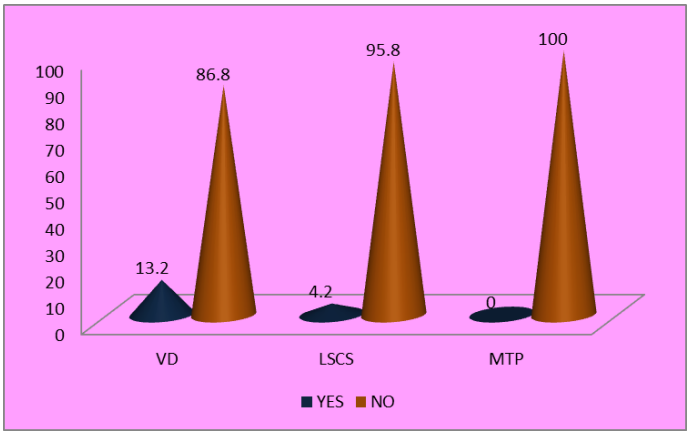

Fig 1: Mode of Deliveries

Table 2: D Dimer values and its Distribution

D Dimer	Frequency	percent	Valid Percent	Cumulative percent
<500	72	48.0	48.0	48.0
501-1000	66	44.0	44.0	92.0
1001-1500	5	3.3	3.3	95.3
1501-2000	2	2.0	2.0	97.3
2001-2500	3	2.0	2.0	98.7
>2500	2	1.3	1.3	100
Total	150	100.0	100.0	

Frequency of higher D Dimer values were observed in about 54% of the study population. Significantly higher levels were found in those with severe preeclampsia. The D Dimer levels of patients with Abruptio placentae, eclampsia, PRES and pulmonary edema were all found to be morethan 800 ng/dl.

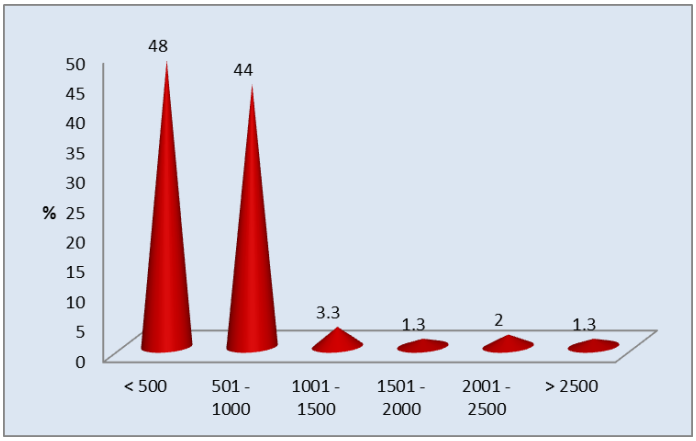

Fig 2: D Dimer values and it's distribution

This study was conducted to determine the D Dimer levels with respect to severity of preeclampsia and its role as a predictor. Pregnant women with severe preeclampsia tend to have higher D Dimer levels than those with non- severe preeclampsia. This depicts a significant association with D Dimer levels and severity of preeclampsia. Hence, D Dimer can be used as a predictor of severity of Gestational hypertension and thereby can be used in formulating therapeutic strategies for a better maternal and neonatal outcome [9-11].

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