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Original Research Paper

Gynaecology

CORRELATION OF MATERNAL AND FETAL OUTCOME IN PREECLAMPSIA WITH MATERNAL LIPID PROFILE

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ABSTRACT

Introduction: Preeclampsia is a common cause for increased maternal and perinatal morbidity and mortality in the developing world. Altered lipid profile is associated with preeclampsia. This study was conducted to evaluate maternal and fetal outcome in correlation with altered lipid profile.

Material and Methods: A case control study was carried out during June 2016 to full May 2017 in obstetrics and gynecology department, HRH, NDMC Medical college, Delhi. Total 240 pregnant women were included in this study in which 120 normotensive pregnant women taken as control group and 120 preeclamptic women were taken as study group. Statistical analysis was done by SPSS version 21.0.

Results: In our study we observed that there was increased systolic and diastolic blood pressure in relation to abnormal lipid profile. There was an increase in maternal morbidities in relation to abnormal lipid profile. Birth weight is significantly related to severity of lipid parameters.

Conclusions: Measurement of serum lipid profile should be done in pregnant women with risk of preeclampsia and other hypertensive disorders to prevent maternal, perinatal morbidity and mortality.

KEYWORDS : Preeclampsia, eclampsia, maternal morbidity, perinatal morbidity

INTRODUCTION

Hypertensive disorders in pregnancy are one of the important causes of maternal, perinatal morbidity and mortality in both developing and developed countries. Among them pre-eclampsia complicates about 3-8% of pregnancies[1].

The main pathology in pre-eclampsia is abnormal placentation. That leads to systemic inflammatory response caused by diminished perfusion and hypoxic environment[2]. Preeclampsia predisposes to maternal complications like eclampsia, HELLP syndrome, placental abruption, disseminated intravascular coagulation, intracranial hemorrhage, hepatic failure, acute renal failure and cardiovascular collapse. Fetal complications like Intrauterine fetal growth restriction (IUGR), low birth weight intrauterine fetal demise and prematurity[3]. Rise in serum lipid parameters is reported to be caused by increased oxidative stress and generated free radicals contributes to endothelial damage leads to pre-eclampsia[4].

ABCD study showed that there is increased risk of maternal morbidity, mortality and preterm delivery if maternal serum shows atherogenic lipid profiles during first trimester[5]. Catov et al states that U-shaped relationship between pre-pregnancy lipid levels and the risk of preterm birth in normotensive, non-diabetic otherwise healthy pregnant women[6]. This study was done to see the correlation of maternal and fetal outcome in pre-eclamptic women with elevated serum lipid profile.

MATERIALS AND METHODS

The study was carried out in Hindu Rao Hospital, North DMC Medical College, Delhi from June 2016 to May 2017. From the antenatal OPD and maternity ward around 1700 women were screened and 240 women were enrolled and divided in two groups:

1. Control Group – 120 normotensive pregnant women.
2. Study Group – 120 pre-eclamptic pregnant women.

Inclusion criteria were all pregnant women aged 18 to 30 years with singleton pregnancy after 28 to 38 weeks of gestation and women who have given consent. Exclusion criteria were (i) multiple Pregnancy (ii) History of chronic hypertension, diabetes, renal disorders, autoimmune disease any other medical co-morbidities which may confound the study findings like epilepsy, anti-tubercular drugs, systemic steroids.

Complete general physical and antenatal examination was done. All routine investigation like complete blood picture, LFT, KFT, PT/INR, Fundus Examination was done. Fetal monitoring was done by daily fetal kick count, ultrasound biophysical profile, fetal biometry and doppler studies. Blood sample was collected from all participants after 8hrs of fasting. Serum lipid profile estimation was done by enzymatic method (Agappe diagnostic limited). Serum VLDL was calculated as 1/5th of triglycerides. The test was done in fully automated analyzer available at the Dept. of Biochemistry at Hindu Rao Hospital.

STATISTICAL ANALYSIS

Categorical variables were presented in number and percentage (%) and continuous variables were presented as mean ± SD. Quantitative variables were correlated using independent t-test between the two groups. Qualitative variables were correlated using Chi-Square test/ Fisher's exact test. A p value of <0.05 was taken as statistically significant. The data was entered in MS EXCEL spreadsheet and analysis was done using Statistical Package for Social Sciences (SPSS) version 21.0.

RESULTS

The mean age of control group is 24± 2.53 years and of study group was 24.05± 2.33 years. There is significant difference in BMI of control group and study group mean of control was 22.59 ±0.98 and that of study group was higher 23.04± 1.01.

There was a significant association between booking status of control and study group. More unbooked patients were there in study group. More primigravida were there in study group (Table 1).

Table 1: Distribution of Booking Status and Parity in Control and Study Group

	Control Group	Study Group	p value *
Booked	114 (95%)	99 (82.5%)	<0.0009
Registered	4(3.33%)	14 (11.6%)	
Un booked	2(1.6%)	7 (5.8%)	
G1	65 (54.2%)	93 (77.5%)	0.0003
G2	55 (45.8%)	26 (21.6%)	
G3	0(0%)	1 (0.83	

There was significant difference between the systolic blood pressure and diastolic blood pressure in control and study group, both reading were on higher side in study group.

There was significant difference between the mean value of Haemoglobin, Platelet count, Aspartate Amino Trasfarase , Aalanine Amino Transfarase, S.Creatinine , Serum Uric acid, Prothrombin time, INR in control and study group. There was no significant difference between the mean value of Haematocrit, Total Bilirubin, Direct Bilirubin, Blood Urea in control and study group.

There was significant difference between the mean level of various lipid components in the control and study group. Mean levels of all the lipid parameters were higher side in study group except for HDL cholesterol. The p value of all the lipid parameters were significant as shown in (Fig 1).

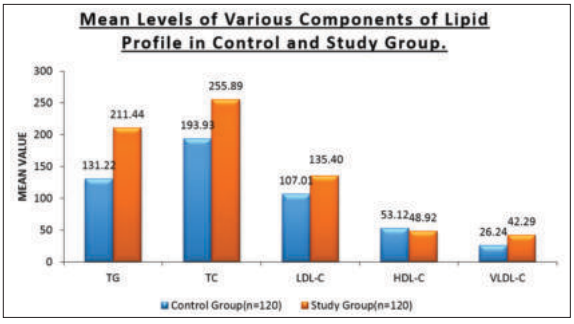

Fig 1

TG: Triglycerides, **TC:** Total cholesterol, **LDL:** High Density Lipoprotein, **HDL:** Low Density Lipoprotein, **VLDL:** Very Low-Density Lipoprotein

There was significant association of deranged components of lipid profile in relation to severity of preeclapmsia (Fig 2).

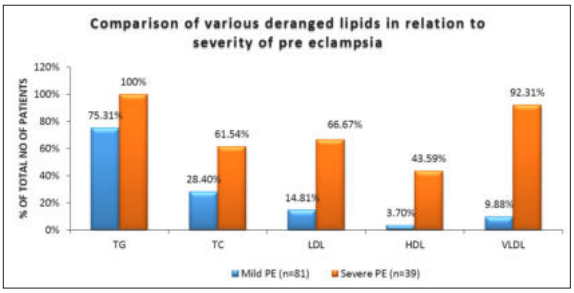

Fig 2

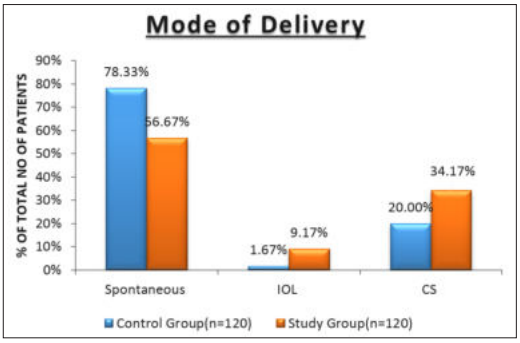

Fig 3

There was significant association between the mode of delivery in study and control group higher operative delivery and induced delivery were more in study group as shown in (Fig 3).

There was significant association between development of various maternal complications in control and study group, more complication were encountered in study group as compared to control group (Table 2).

Table 2:- Distribution of Various Complications Encountered in Control and Study Group

Complications		Control Group	Study Group	p value*
Ante Partum	APH	0(0%)	6 (5%)	<0.001
	Eclampsia	0(0%)	5 (4.17%)	
	IUD	0(0%)	3 (2.50%)	
	IUGR	3(2.5%)	8 (6.67%)	
Intra Partum	Eclampsia	0(0%)	2 (1.67%)	<0.004
	Fetal Distress	8(6.67%)	25(20.83%)	
	Shoulder Dystocia	1(0.83%)	0(0%)	
Post Partum	Hemorrhage requiring BT	2 (1.67%)	13 (10.83%)	<0.002
	Eclampsia	0(0%)	5 (4.17%)	
	ICU Admission	0(0%)	1(0.83%)	
	Puerpural Sepsis	0(0%)	1(0.83%)	

The mean birth weight of control group was 2.94±0.28 kg and that of study group 2.61 ± 0.34kg that is statistically significant.

As depicted in table 3 number of babies with birth weight > 2.5kg in the study group were 76.67% while in the control group 96.67% and birth weight < 2.5 kg in study group were 23.33% and in the control group were 3.33%. It was found statistically significant (p value-0.0001). We also found mean Apgar score of control group was 7.41±0.7 (1 minute) and 8.81±0.65 (5 minute). In study group mean Apgar score was 7.09±1.15 (1 minute) and 8.55±1.05 (5 minute). It was statistically significant at 1 minute and at 5 minutes. In the study group 15% of newborns were admitted in NICU, in control group only 5% newborns required NICU admission (p value-0.010). More babies required NICU admission in the study group as compared with the control group.

Table 3: Fetal outcome in study and control group

		Study group (n=120)	Control group (n=120)	P value*
Birth weight	< 2.5	28 (23.33%)	4 (3.33%)	< 0.0001
	>=2.5	92 (76.67%)	116 (96.67%)	
Apgar score at 1 min	<7	17 (14.16%)	5 (4.17%)	0.0006
	>7	99 (85.34%)	11 (95.83%)	
Apgar score at 5 min	<7	16 (13.79%)	4 (3.33%)	0.004
	>7	100 (86.21%)	116 (96.67%)	
NICU requirement	+	18 (15%)	6 (5%)	0.010
	-	102 (85%)	114 (95%)	

There was significant difference between birthweight in relation to deranged components of lipid profile in study group (table 4).

Table 4: Birth weight in relation to deranged components of lipid profile in study group.

Birth weight (kg)	TG	TC	LDL	HDL	VLDL
<2.5 (n=28)	28 (100.0%)	16 (57.14%)	19 (67.85%)	12 (42.85%)	26 (92.25%)
>2.5 (n=92)	72 (78.26%)	31 (33.69%)	19 (67.85%)	8 (8.69%)	18 (11.95%)
P value*	0.004	0.026	0.001	0.001	0.001

DISCUSSION

Preeclampsia is one of the mo st common cause of maternal, perinatal morbidity and mortality. In our study mean age in controls 24±2.53 and in study group 24.05±2.33, was comparable to NAF islam[7] et al in 2011, 24.9±4.04, 24.17±4.90 respectively. It was observed that BMI in control group was 22.59±0.98 and in study group 23.04±1.01 which was comparable to Musleh Uddin Kalar[8] et al in 2012, 22.92±0.61, 22.94±0.67 respectively.

In our study it was observed that majority are primigravida. Control group had 41.1% primigravida and that of study group 58.9%. Similar results were observed by Praveen M[9] et al (61.2%).

The mean systolic and diastolic BP in our study group was 137.27 ± 5.62 and 90.61 ± 2.12 respectively and of control group was 103.77 ± 5.56 and 66.37 ± 5.96 respectively was comparable to Musleh Uddin Kalar[8] et al in 2012 (Table 5).

Table 5: Comparison of BP in Control, Study and other Study.

Mean ±SD of Blood Pressure	Control group	Study group	Musleh Uddin Kalar[8] et al in 2012
Systolic BP	103.77 ± 5.56	137.27 ± 5.62	154 ± 0.55
Diastolic BP	66.37 ± 5.96	90.61 ± 2.12	102 ± 0.73

In our study the Laboratory investigations are comparable with Sachan et al[10]

Table 6: Comparison of Lab Investigation in Control, Study Group with other study.

Lab investigations (units)	Control group	Study group	p value*	Sachan et al[10] p values
Haemoglobin (g/dl)	12.56 ± 0.96	12.31 ± 0.88	0.0420	0.0059
Platelet (lakh/mm^3)	2.51 ± 0.55	1.91 ± 0.3	<.0001	<0.001
T. Bilirubin (mg/dl)	0.78 ± 0.09	0.79 ± 0.09	0.3242	<0.001
D. Bilirubin (mg/dl)	0.13 ± 0.05	0.14 ± 0.07	0.3347	<0.001
Aspartate amino trasfarase (U/l)	28.21 ± 3.76	39.82 ± 18.01	<.0001	<0.001
Aalanine Amino Transfarase (U/l)	35.58 ± 4.73	43.03 ± 16.6	<.0001	<0.001
Blood.Urea (mg/dl)	25.5 ± 4.04	25.36 ± 3.91	0.7829	<0.001
S.Creatinine (mg/dl)	0.73 ± 0.12	0.81 ± 0.08	<.0001	<0.001
Serum Uric acid (mg/dl)	2.88 ± 0.32	3.05 ± 0.39	0.0004	<0.001
Prothrombin time (sec)	13.34 ± 0.39	14.37 ± 1.73	<.0001	-
INR	1.02±0.01	1.1±0.19	<0.0001	-

The mean Standard Deviation of various lipid parameters in our study was comparable to Kashinakunti S[11] et al in 2010 (Table 7).

Table 7: Comparison of Lipid parameter in present study with other study.

LIPID PROFILE (mg/dl)	TG	TC	LDL	HDL	VLDL
Present study	211.44 ± 68.05	255.89 ± 57.94	135.4 ± 27.59	48.92 ± 4.87	42.29 ± 13.61
Kashinakunti et al 20109	214.86 ± 51.49	193.37 ± 43.98	111.43 ± 40.70	43.2 ± 8.71	40.33 ± 10.84

In our study we observed that there was a significant difference in the mode of delivery between control and study group (p value <0.001). In the control group 78.33% patients were delivered spontaneously, 1.67% were induced and 20% were undergone caesarean section and the most common indication for LSCS was CPD (54.1%). While in study group 56.67% patients were spontaneously delivered, 9.17% patients undergone induction while 34.17% were posted for LSCS and the most common indication of LSCS was fetal distress (82.75%). Similar results were seen with Sachan et al[10] 62.66% normal deliveries and 37.32% LSCS.

As shown in table 2, in the study group there was significantly an increased rate of complications in antepartum, intrapartum and postpartum period. (p value 0.001, 0.0003, 0.002 respectively). In our study antepartum hemorrhage was seen in 5% preeclamptic women whereas in study of Parveen[9] et al in 2015 (13.9%).

In our study 10.0% patients had eclampsia similar results are seen with Praveen et al[9] (5.30%). Hemorrhage requiring Blood Transfusion is 10.83% in our study whereas study of Praveen et al[9] found 10.75%.

Preterm deliveries in the study group was 8.33% where as in controls there were no preterm deliveries which was statistically significant (p value-0.002) similar results were observed with Vats et al[12] (26.5%).

In the study group, birth weight > 2.5 kg were 76.67% and <2.5 kg were 23.33%. Similar results were seen with Gawde et al[13] <2.5 Kg (25%) and >2.5Kg (75%).

In the study group Apgar score < 7 at 1 min is 14.16% and Apgar score < 7 at 5 mins 13.79%. Similar results were observed by Sachan R et al[10] where Apgar <7 at 5 min (16.90%).

In the study group 15% newborns were admitted in NICU, in controls only 5% of neonates required NICU admission. There was no neonatal death both in cases and controls. Similar results were observed by Vats et al[12] 25.5% were required NICU admission.

In the study group, perinatal mortality is 2.5%. One patient had severe preeclampsia with IUD. There are no early neonatal deaths in both control and study group.

CONCLUSIONS

The present study concludes that measurement of serum lipid profile should be done in pregnant women with preeclampsia and hypertensive disorders as a routine workup. Timely evaluation and intervention in tertiary care center with better NICU facility, teamwork can prevent maternal complications, perinatal morbidity, mortality and improve outcome.

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