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MATERNAL AND NEONATAL OUTCOMES IN PREECLAMPSIA SYNDROME

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ABSTRACT

Aim: The aim of the study was to determine the outcomes and complication of preeclampsia syndrome in pregnancies

Methodology: It was a Prospective observational study conducted at Indira Gandhi memorial hospital, Shirpur, Dhule. In this study a total 971 primigravida and multigravida pregnant women was observed out of which, 73 preeclamptic pregnancies were reviewed from July 2009 to February 2010. All study related data collections were conducted in accordance with Ethical background for Investigations of the preeclampsia syndrome.

Results: A total 73 preeclamptic pregnancy (7.51%) syndrome was observed in between 18-22 (61.64%) years of age and in primigravida (n=43) and most of pregnant women found to be the middle class. The data of pathological report, month of pregnancy and neonatal outcomes differences was statistically significant. The preeclampsia surveillance mainly diagnosed at mild hypertension (n=64) 140/90 mmHg, severe hypertension (n=9), proteinuria found to be trace amount to ≥ 1+ dipstick and face, leg, and palm edema were observed. Also, HELLP syndrome was (8%), in which hemolysis7.40±0.54 gm%, low platelet count 1.06±0.20 lacks, elevated liver enzymes SGPT 80.17±14.96 IU/dl and SGOT 47.97±8.17 IU/dl was reported and eclampsia was (10%) observed at severe hypertension systolic BP 167.17±11.84 and diastolic BP 104.33±3.43. A maximum 48 incidence of caesarean mode of delivery was observed. Low birth weight was 1.7±0.18 kg, still birth 9 and IUD 1.

Conclusion: The study conclude that the preeclampsia syndrome still the cause of maternal morbidity and neonatal mortality and morbidity, there is a need of early diagnosis, role of patients which helps to reduce the risk of pregnancy complications.

INTRODUCTION: Around 5-7% Preeclampsia complications were observed in all pregnancies diagnosed from mid pregnancy but derived from1st trimester pathology [1]. Preeclampsia is a severe complication of pregnancy, commonly defined as de novo hypertension and proteinuria before 34 weeks gestational age. Early onset of preeclampsia is a potentially life-threatening disease for both mother and baby [2, 3]. The preeclampsia is multisystem disorder, in severe condition eclampsia was observed in end of pregnancy and HELLP syndrome physical changes was observed, including the breakdown of red blood cells, changes in liver and low platelets [4].

7% Preeclampsia affects of first pregnancies which leads to cause of maternal death and a major contributor to maternal and perinatal morbidity. Preeclampsia (PE) is associated with maternal perinatal morbidity and mortality and affects 5% to 7% of pregnant patients worldwide. Hypertension complicates about 7±13% of all pregnancies. Preeclampsia syndrome can be diagnose mainly by blood pressure (>140/90 mmHg or more than), Proteinuria (> +2 dipstick), edema, renal dysfunction, liver disorder, etc. are the diagnosis parameters to find out preeclampsia severity in women and for the fetus birth. Up to 18% of foetal deaths are associated with hypertensive disorders [5].

MATERIAL AND METHOD: 971 cases of pregnancy were admitted at Indira Gandhi Memorial Hospital, Shirpur, Dhule from 16 Jul 2009 to 28 Feb 2010. In this study preeclampsia syndrome were recruited in the study and it was approved by Institutional Human Ethics committees of R. C. Patel Institute of Pharmaceutical Education and Research. There had been 971 cases kept of which 898 women were from normal group and 73 women from preeclampsia group. The 7.51% incidence of preeclampsia was observed in pregnancies. The data of pregnant women from 6th month up to 9th month was taken for their regular check up. In 971 cases preeclampsia and normal pregnancy cases were reviewed in two groups, 73 from preeclampsia and 898 from normal pregnancy. According to the inclusion and exclusion criteria of all pregnant women are consider in this study and secondary cause of hypertension they were excluded. The data were categorized according age, month of pregnancy, pathological parameters, socio-economical background, mode of delivery, neonatal outcomes.

Statistical Analysis: The data on HELLP syndrome and eclampsia were analyzed using mean and standard deviation, the analysis of other parameter in between two groups normal and preeclampsia was followed by student unpaired t-test.

RESULTS: Out of 971 pregnant women, a total 73 (7.51%) were found to be preeclamptic syndrome. Neonatal outcomes in preeclampsia study group like still birth and IUD was 8 (10.96%) and 1 (1.37%) respectively, in normal group it was 8 (0.89%) IUDs (**Table 1**).The incidence of the preeclampsia syndrome was observed in women from poor, middle class and housewives. The illiterate women were more prone to the risk of preeclampsia group (**Table 2**). Age wise risk of preeclampsia incidence was observed between 18-22 and 23-27 age group in both normal and preeclampsia group and very few were observed in the more than 28 year of age according to the results teenagers more prone to the preeclampsia syndrome. The primigravida, in normal group the 514 women out of 898 normal pregnant women and 43 women from preeclampsia group out of 73 preeclamptic pregnant women. An incidence of primigravida was risk of preeclampsia syndrome. 60.27% women from preeclampsia group was not taken

proper care during the pregnancy out of n=73(100%) and in normal group 12.24% women were not taken care out of n=898 (100%). As compared to the normal group preeclampsia women not had taken the proper care during the pregnancy. The headache complication in preeclampsia group was observed in 79.48 % and in normal group it was 14.25%, the incidences was observed in the preeclampsia group and the incidence of vision complication in preeclampsia group was 58.05% higher than normal group, in the normal group only 0.5 % women having the vision problem.

The edema diagnosis in which the face edema and palm edema diagnosed in preeclampsia group out of 73 women 57 shows face edema and 38 shows palm edema and in normal group pregnant women not having signs of face and palm edema, leg edema was observed in both group but incidence of leg edema was maximum in preeclampsia group 93.15% than normal group 15.59%. The pregnant women mode of delivery evaluation in both groups shows the incidence of caesarean mode of delivery was observed in preeclampsia group than normal group (Table 2). Preeclampsia group was divided in the two groups mild and severe hypertension according the blood pressure diagnosis incidence was observed in mild hypertension in the 87.67% cases.

The disease progression to severe preeclampsia occurs from mild hypertension (**Table 3**). In the sonographic diagnosis, the maximum women sonographic report having the cephalic presentation in their sonography. Only the changing lie report found to be in preeclampsia group the results which are getting form the sonographic evaluation not shows much difference in the between two groups (**Table 4**). HELLP syndrome in preeclampsia group diagnosed with the severe hypertension, the platelet count was lower than normal range ≥1 lacks. Hemoglobin count lower most of women were anemic 7.40±0.53 and liver enzymes were elevated, SGPT level increased doubled than normal 80.17±41.96 and SGPT level also increased up to 47.95±8.2. In eclampsia diagnosis, 6 women were having eclampsia and HELLP syndrome and 1 women having only hypertension the women which suffers from eclampsia they having severe hypertension, anemia, low platelet count, also show the symptoms of elevated liver enzymes, the data suggest that the eclampsia observed at sever level of preeclampsia (**Table 5**). Pathological diagnosis of proteinuria in between normal and preeclampsia group shows the incidence of high level of proteinuria was found to be in preeclampsia group, the report shows trace amount to 3+ dipsticks proteinuria in preeclampsia it was higher than normal range (**Fig. 1**). Statistical difference in both groups shows the significant results. The age difference from both groups was not significant groups not having the much difference between two groups.

Preeclampsia Diagnosis started after the 6 month, in between 7-8 months the most of cases were observed from preeclampsia group. Normal pregnancy and preeclampsia pregnancy of women were shows the significant result of diagnosis at 7 month. The diastolic and systolic blood pressure shows the significant results, the blood pressure in preeclampsia group shows the incidence of hypertensive disorder. Pathological investigation in which hemoglobin count in preeclampsia group was lower at anemic level than normal group and platelet count was lower than normal group the significant difference shows that the hemoglobin and platelet count in preeclampsia group was lower. The serum creatinine normal range was 0.7- 1.2 mg/dl the level was elevated in preeclampsia group than normal group shows the significancy in result.

Total leukocytes count was not showing significant results in both groups. Birth weight analysis in between 3 groups total birth weight, normal birth weight and low birth weight compared in both group shows the significant difference, in 3 groups the preeclampsia group shows the birth weight was lower than normal (**Table 6**).

TABLE 1: THE COMPARISON OF RISK AND COMPLICATION IN PREECLAMPSIA GROUP AND NORMAL GROUP

	Normal group n (%)	Preeclampsia group n (%)	Total n (%)
Pregnancies	898 (92.48%)	73 (7.52%)	971(100%)
Neonatal birth	890 (91.65%)	64(87.67%)	954(98.34%)
Still birth	0 (0%)	8(10.96%)	8(0.82%)
IUD	8 (0.89%)	1(1.37%)	9(0.92%)
Age distribution			
18-22	554 (61.69%)	45(61.64%)	599(61.68%)
23-27	289 (32.18%)	25(34.25%)	314(32.34%)
28-32	48 (5.35%)	2(2.74%)	50(5.15%)
>32	7 (0.78%)	1(1.38%)	8(0.82%)
Gravida			
Primigravida	514 (57.23%)	43 (58.90%)	557(57.36%)
multigravida	384 (42.77%)	30 (41.10%)	414(42.64%)
Preeclampsia complication			
Headache	128 (14.25%)	58 (79.48%)	186 (19.16%)
Vision disturbances	5 (0.5%)	37 (58.60%)	42 (4.32%)
Edema condition			
Leg	140 (15.59%)	68 (93.15%)	208 (21.42%)
Face	0 (0%)	57 (78.08%)	57 (5.87%)
Palm	0 (0%)	38 (52.05%)	38 (3.91%)
Mode of delivery			
Caesarean delivery	91 (10.13%)	48 (65.75%)	139(14.32%)
Normal delivery	807 (89.86%)	25 (34.24%)	832 (85.68%)

TABLE 2: DISTRIBUTION SOCIOECONOMIC STATUS IN BETWEEN NORMAL AND PREECLAMPSIA GROUP

Title	Subtitle	Observation	Frequency of patients	
			Normal group (n %)	Preeclampsia Group (n %)
Socio- economic status	Annual income	10,000-20,000 (poor)	187 (20.83%)	13 (17.80%)
		20,000-40,000 (middle class)	642 (71.49%)	56 (76.71%)
		Above 40,000 (rich)	69 (7.68%)	4 (5.48%)
	Education	Literate	653 (72.71%)	21 (28.77%)
		Illiterate	245 (27.28%)	52 (71.23%)
	Working status	Housewife	879	63
		Worker/ Farmer	19	10

TABLE 3: NUMBER OF CASES IN DIFFERENT CLASSES OF PREECLAMPSIA

Classes of preeclampsia	No. of cases	Range of systolic BP	Range of diastolic BP
Mild preeclampsia	64	140- 160 mmHg	90-100 mmHg
severe preeclampsia	9	≥160 mmHg	≥110 mmHg

TABLE 4: CORRELATION OF SONOGRAPHIC REPORT WITH PREECLAMPSIA AND NORMAL PREGNANCY

No. of cases	Cephalic presentation	Breach Presentation	Changing lie
Normal pregnancy	888 (98.88%)	9 (1%)	1 (0.11%)
Preeclampsia pregnancy	64 (87.67%)	1 (1.36%)	8 (10.95%)

TABLE 5: HELLP SYNDROM AND ECLAPSIA DIAGNOSIS ON THE BASIS OF PATHOLOGICAL AND BLOOD PRESSURE TESTING

No. of Cases	Systolic BP (mmHg)	Diastolic BP (mmHg)	Platelet count (Lacs)	Heamolysis gm%	Elevated Liver Enzymes (IU/dl)		Eclampsia
					SGPT	SGOT	
1)	170	104	1.3	7.2	68	42.31	Present with HELLP
2)	165	110	1	6.8	163	63.85	Present with HELLP
3)	170	104	0.7	6.8	63	47.53	Present with HELLP
4)	164	104	1.2	7.8	45	48.21	Present with HELLP
5)	160	102	1.2	7.8	78	43.36	Present with HELLP
6)	174	102	0.98	8	64	42.46	Present with HELLP
7)	197	110	2	9.4	38	28.72	Present without HELLP
Normal ranges	120	75	0.6 -1.4	12- 14	0 - 40	1.5- 45	
HELLP syndrome pregnant women mean and standard deviation							
Mean and S.D.	167.17± 5.08	104.33± 2.94	1.06± 0.21	7.40± 0.53	80.17± 41.96	47.95± 8.198	– –
Eclampsia pregnant women mean and standard deviation							
Mean and S.D.	171.19±12.15	105.05±3.42	1.06±0.40	7.7±1.0	74.14±41.49	45.20±10.43	Present

TABLE 6: THE STATISTICAL COMPARISON OF OBSERVED PARAMETERS IN PREECLAMPSIA PATIENT AND NORMAL GROUP BY UNPAIRED T- TEST

Parameter	Normal group	Preeclampsia group	p value
Demographic data			
Age (years)	22.49 ± 2.93	22.56 ± 2.61	NS
Month of pregnancy	7.56 ± 1.08	7.89 ± 0.99	p<0.0143
Blood pressure diagnosis (mean and SD)			
Systolic BP(mmHg)	114 ± 5.501	148.2 ± 12.95	p<0.0001
Diastolic BP(mmHg)	75.17 ± 4.7	97.30 ± 4.5	p<0.0001
Laboratory investigation			
Hb (gm %)	9.22 ± 1.08	8.87 ± 1.53	p<0.0124
Platelet count (lacks)	3.05 ± 0.71	2.19 ± 0.56	p<0.0001
Serum creatinine	1.15 ± 0.27	1.37 ± 0.25	p<0.0001
TLC	8036 ± 1218.5	8142 ± 1354.8	NS
Neonatal outcome			
Birth weight	2.63 ± 0.52	2.09 ± 0.38	p<0.0001
NBW	2.7 ± 0.47	2.3 ± 0.28	p<0.0001
LBW	1.92 ± 0.098	1.7 ± 0.18	p<0.0001

Significance was p<0.05

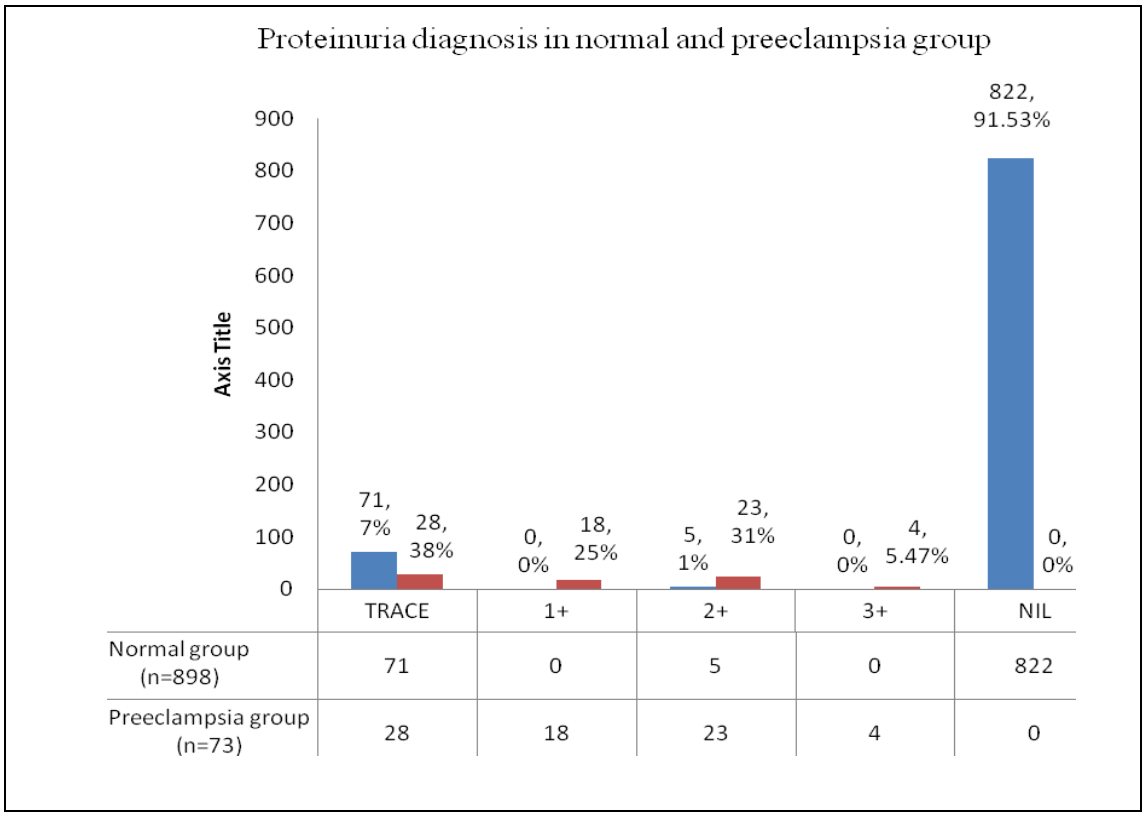

FIG. 1: PROTEINURIA DIAGNOSIS IN NORMAL AND PREECLAMPSIA GROUP

DISCUSSION: Noreen Akmal and Gul-E-Raanain in their study reported incidence of younger's and primigravida in the age of patients in normal group I was below 20 years in 45% patients while 66% patients in group II were below 20 years and primigravidas 62% and in those who belong to low socio-economic class 75%, in our study it was 58.90% of primigravida and 17.80% in low socio-economic class, middle class 76.71% and 61.69% in normal group and 61.64% in preeclampsia group of age 18-22 years the incidences was observed in younger's. Estimated results from our study the younger's, primigravida, middle class and poor class shows the high risk of preeclampsia syndrome [6].

Lindsay *et al*. in their study studied that the low education status people possess the risk of preeclampsia and in our study the 71.23% of women was illiterate and most of women were housewives the incidence of risk found to be in preeclampsia group [7]. Lana K. Wagner in their study found out that 1/4 of women with gestational hypertension develop proteinuria and thus progress to preeclampsia, new onset of preeclampsia shows the hypertension and proteinuria and after 20 weeks progression of preeclampsia it develops in elevation of hypertension and protein and develops in sever preeclampsia and in our study the out of 73 preeclamptic pregnant women 64 having mild hypertension and 7 having severe hypertension in which the women after 20 weeks of gestational period shows the incidence of mild hypertension and few cases shows the progression of the severe preeclampsia.

The proteinuria found to be with hypertension, in Preeclampsia group proteinuria found to be >1+ dipstick and in normal group trace amount of proteinuria was found [8]. Adeney *et al*., in their 10 identified studies, 8 suggested a positive association between migraine headaches with preeclampsia. Noris *et al*., in their review found out hypertension, proteinuria and preeclampsia can be associated with edema, visual disturbances, headache In the study headache disorder in normal group was (n=128) 14.22% in n=898 cases, and in preeclamptic group it was (n=58) 79.48% in n=73 cases, the vision disturbance in preeclampsia group was (n=37) 58.60% and in normal group it was (n=5) 0.5% [9, 10]. Peripheral edema was found in normal and preeclampsia group, the normal pregnant women having only leg edema n=140 (15.49%) and in preeclampsia group out of 73 women, Leg edema n=68 (93.15%), face edema 57 (78.08%), palm edema 38 (58.05%). Bryan Woodford reported that beginning of the second trimester the mother developed swelling in her feet. The edema rapidly progressed and within 2 weeks, it was evident in feet, ankles, hands, and face [11].

The most of pregnancy were observed as caesarean mode of delivery. The result obtained in this correlation was n=807 (89.89%) normal vaginal delivery and n=91 (10.13%) caesarean section in normal group. The preeclamptic group cases was higher than normal group, n=25 (34.24%) normal vaginal deliveries and n=48 (65.75%) caesarean section in preeclamptic group. Tan *et al*., showed the evidence of preeclampsia, the preterm of delivery was the commonest problem. The incidences of caesarean delivery were higher than control group [12].

Rath *et al*., found out in HELLP syndrome, elevation of liver enzymes, low platelet count and hemolysis was observed. In our study it was observed in n=6 (8%) cases in preeclamptic group n=73. The systolic blood pressure was 167.17± 5.08 mmHg and diastolic blood pressure was 104.33±2.94 mmHg. The pathological report was shows heamolysis, elevated liver enzymes, low platelet count the values are 7.04±0.53 gm%,

SGPT 80.17±41.96 IU/dl, SGOT 47.95±8.198 and 1.06±5.08 respectively [13]. The past evidences studied, the HELLP syndrome is associated with increase in maternal and perinatal mortality & morbidity [14]. The eclampsia in preeclampsia was observed in n=7 (10%) cases. The eclampsia was observed in sever preeclampsia, the severe preeclampsia range of hypertension was found to be systolic 167.17±11.84 mmHg and diastolic 104.33 ±3.43 mmHg. Sandhu *et al*., in their study reported the incidence of eclampsia and it was found 5% of patients who had eclampsia, which contributed to 8.3% of maternal mortality and this is comparable to some reported studies [15].

Pathological Investigation: In this study the Hb% was lower in preeclampsia group than normal group, the 9.22±1.08 Hb% in normal group and in preeclampsia group it was 8.87±1.53 Hb%, p<0.0124. Singh *et al*., in their study reported, in preeclampsia, anemia was not significant and by reducing plasma volume, reduces the supply of nutrient to the fetus thus affecting fetal growth. The preeclampsia syndrome and low birth weight having the correlation with low hemoglobin level [16]. Boehm *et al*., in their study suggested the evidences that due to platelet agreeability, the platelet count lower in the whole blood.

In our study platelet count was measured in both group, it was observed that 3.05±0.71 lakes in normal group and 2.19±0.59 lakes in preeclamptic group, the significance was p<0.0001 [17]. In our study the serum creatinine was found to be 1.15±0.27 mg/dl in normal group and in preeclampsia group it was 1.37±0.25 there is elevation in the preeclamptic group. The significance was p<0.0001. Lelia Duley in their diagnosis of pre-eclampsia is strengthened if there is further indication of multisystem involvement, such as raised serum creatinine [18].

Neonatal Outcomes: Singh *et al*., in their study reported that the preeclampsia syndrome was one of the measure cause of the low birth weight, in our study it was analyzed in 3 total birth weights, normal birth weight and low birth weight, it was observed that 2.63±0.52, 2.7±0.47 and 1.92±0.098 in normal respectively. In the preeclampsia group, the birth correlation shows 2.09 ±0.38, 2.3±0.28 and 1.7±0.18 respectively. The significance of all analysis was p<0.0001. The data indicates low birth weight in neonates was lower in preeclampsia group than normal group. There was a significant relationship between maternal diseases such as preeclampsia and hypertension [14].

Alam *et al*., reported evidences of the complication related to the neonatal outcomes includes the IUGR (Intrauterine growth retardation), IUD (Intrauterine death), still birth was observed in preeclampsia or in hypertensive disorder in pregnancy. In our study 8 (0.89%) cases in the normal group and in preeclampsia group 1 (1.3%) case of IUD were observed. Still birth record shows, 8 (10.95%) in preeclampsia group and 0% in normal group. Solange Regina Perfetto Chaim, et al., found out there was correlation in between eclampsia and neonatal complication. In our study eclamptic mother, the neonatal outcomes like low birth, still born were observed [19, 20].

CONCLUSION: The study conclude that the preeclampsia syndrome still the cause of maternal morbidity and neonatal mortality and morbidity, the low socio-economical status, low educational status, primigravida, and younger's having the risk of preeclampsia. The pathological testing and sign and symptoms help to reduce the risk of pregnancy complication. The early diagnosis useful for reduce maternal complication.

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