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Original research article

Severe preeclampsia at term gestation: Clinical profile

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Abstract

Preeclampsia is considered superimposed when it occurs in a woman with chronic hypertension. It is characterized by worsening or resistant hypertension (especially acutely), the new onset of proteinuria or a sudden increase in proteinuria and/or significant new end-organ dysfunction after 20 weeks of gestation in a woman with chronic hypertension. Information regarding the marital history, menstrual history, significant past history, medical history, history of treatment taken for PE was included in the proforma. A comprehensive general physical examination, systemic and obstetric examination was conducted. BP was measured using a Mercury Sphygmomanometer in the right arm, sitting position. Incidence of NICU admission amongst babies born to cases was found to be 42.5% as compared to controls i.e., 20%. This difference in the proportion of NICU admissions amongst cases and controls was found statistically significant i.e. (p<0.05). It means incidence of NICU admissions was significantly higher in preeclampsia cases in our study.

Keywords: Severe preeclampsia, hypertensive disorders of pregnancy, gestational age

Introduction

Preeclampsia is a syndrome characterized by the onset of hypertension and proteinuria or hypertension and end-organ dysfunction with or without proteinuria after 20 weeks of gestation**.** Additional signs and symptoms that can occur include visual disturbances, headache, epigastric pain, thrombocytopenia, and abnormal liver function. These clinical manifestations result from mild to severe microangiopathy of target organs, including the brain, liver, kidney, and placenta. Potential serious maternal sequelae include pulmonary edema, cerebral hemorrhage, hepatic failure, renal failure, and death. The fetal/neonatal burden of disease results from placental hypoperfusion and dysfunction and, in turn, the frequent need for preterm birth [1].

Preeclampsia is considered superimposed when it occurs in a woman with chronic hypertension. It is characterized by worsening or resistant hypertension (especially acutely), the new onset of proteinuria or a sudden increase in proteinuria and/or significant new end-organ dysfunction after 20 weeks of gestation in a woman with chronic hypertension.

Hypertensive disorders of pregnancy, including preeclampsia, consist of a broad spectrum of conditions which are associated with substantial maternal and fetal/neonatal morbidity and mortality. The incidence is estimated to be between 3 and 10% of all pregnancies. Worldwide, preeclampsia and related-conditions are among the leading causes of maternal mortality. While maternal death due to preeclampsia is less common in developed countries, maternal morbidity is high and is a major contributor to intensive care unit admissions during pregnancy [2].

Approximately 12 to 25% of fetal growth restriction and small for gestational age infants as well as 15 to 20% of all preterm births are attributable to preeclampsia; the associated complications of prematurity are substantial including neonatal deaths and serious long-term neonatal morbidity. Despite major medical advances, the only known cure for preeclampsia remains delivery of the fetus and placenta [3].

The etiology of preeclampsia is complex, and a role for maternal and fetal and/or paternal genetic determinants has been suggested by early family-based studies. The association of ethnicity with preeclampsia severity has generally been investigated in within-country studies in multicultural settings, comparing mostly African American, Hispanic, and White subgroups in the United States [4].

In addition to the scarcity of data about Asian or Chinese women as an ethnic subgroup in those studies, there are no population-based studies of preeclampsia among women in China. However, the many racial and ethnic differences that were noted in a recent review suggest that there could be important differences between women in China and Europe. Ethnic differences reflect many factors, such as lifestyle, socioeconomic status, cultural norms, and the seeking and provision of medical care, which can have a greater association with differences between countries than racial or genetic factors. However, genetic

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studies have suggested some association with preeclampsia, including variations in MS-like tyrosine kinase 1 and vascular endothelial growth factor C12 and a microsatellite variation in the heme-oxygenase 1promoter in a Finnish cohort but not in a Chinese cohort. Thus, based on the various types of evidence available from current research and the potential impact of health care infrastructure on diagnosis, management, and related complications of preeclampsia, we hypothesized that the etiology, severity, and consequences of preeclampsia may differ in a country-level comparison of China and Sweden [5].
Increasing evidence indicates that PE&E is not just a disease of pregnancy that resolves at the time of delivery, but rather it represents a risk marker of cardiovascular diseases later in life. Studies in western populations examining the risk of developing type 2 diabetes in women with a history of pre-eclampsia have found a positive association equalling the risk attributed to obesity and smoking. The Danish National Patient Registry study, for example, found that pre-eclampsia is associated with a 3.1–3.7-fold risk of developing type 2 diabetes [6].

Methodology

Study population

Group 1: Cases - pregnant women clinically diagnosed with severe preeclampsia in third trimester (BP>160/110, Proteinuria 3gm/day, with or without pathological edema)
Group 2: Control- normal pregnant women in third trimester
Study design: Case control study
Sample size: We planned to take 80 patients. We have two groups. Accordingly, in each group we included 40 subjects.
Sampling technique: Simple Random sampling method

Inclusion criteria

- Normotensive pregnant women in third trimester
- Pregnant women with severe preeclampsia at term singleton pregnancy
- No imminent signs

Exclusion criteria

- Pregnant Women with chronic hypertension, gestational hypertension, mild preeclampsia, eclampsia.
- Pregnant women with conditions like diabetes mellitus, gestational diabetes, cardiovascular disease, chronic liver and kidney disease, severe anemia, multiple pregnancies and chronic diseases that interfere withstudies.
- Pregnant women with the history of smoking/alcoholism
- Pregnant women on antifolate drugs like methotrexate
- History of epilepsy in prepregnant state, space occupying lesion in brain.

Methods of data collection

We carried out a face-to-face interview using a pre-designed and pre-tested proforma. The proforma included information pertaining to the age, gestational age, obstetric score and the last menstrual period (LMP). The expected date of delivery (EDD) was calculated. Information regarding the marital history, menstrual history, significant past history, medical history, history of treatment taken for PE was included in the proforma. A comprehensive general physical examination, systemic and obstetric examination was conducted. BP was measured using a Mercury Sphygmomanometer in the right arm, sitting position. The BP measurement was repeated after 15-20 minutes and the highest reading of the two was entered in the proforma. The participant was asked to submit a random midstream urine sample and proteinuria was estimated using a spot urine dipstick method, using visual reagent strips, considered as a quick, portable, and easy to do method for analysis of proteinuria.

Results

Table 1: Incidence of IUGR among cases and controls

		Cases		Controls		P
		Frequency	Percent	Frequency	Percent	
IUGR	Yes	10	25.0	0	0.0	0.003 Highly significant
	No	30	75.0	40	100.0	
	Total	40	100.0	40	100.0	

Incidence of IUGR amongst cases was found to be 25% as compared to controls i.e. 0%. This difference in the proportion of IUGR babies amongst cases and controls was found statistically significant i.e. (p<0.05). It means incidence of IUGR was significantly higher in preeclampsia cases in our study.

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Table 2: Distribution of cases and controls according to mode of delivery

		Cases		Controls		P
		Frequency	Percent	Frequency	Percent	
Mode of Delivery	LSCS	22	55	17	47.5	0.37 Not significant
	vaginal	18	45	23	57.5	
	Total	40	100.0	40	100.0	

LSCS rate amongst cases was 55% as compared to 47.5% amongst controls. This difference in the proportion of caesarean number amongst cases and controls was found statistically not significant i.e. (p>0.05).

Table 3: Distribution of cases and controls according to gender of child

		Cases		Controls		P
		Frequency	Percent	Frequency	Percent	
Sex of the child	Female	16	40.0	17	42.5	0.68 Not significant
	Male	24	60.0	23	57.5	
	Total	40	100.0	40	100.0	

40% babies born to preeclampsia mothers were females and 42.5% babies born to control mothers were females. 60% babies born to preeclampsia mothers were males and 57.5% babies born to control mothers were females.

Table 4: Distribution of cases and controls according to birth weight

		Cases		Controls		P
		Frequency	Percent	Frequency	Percent	
Birth weight (kg)	2.5-3.5	22	55.0	30	75.0	0.06 Not significant
	< 2.5	18	45.0	7	17.5	
	< 1.5	0	0.0	3	7.5	
	Total	40	100.0	40	100.0	

Incidence of LBW amongst cases was found to be 45% as compared to controls i.e. 17.5%. This difference in the proportion of LBW babies amongst cases and controls was found statistically not significant i.e. (p>0.05). It means incidence of LBW was significantly higher in preeclampsia cases in our study.

Table 5: Distribution of cases and controls according to liquor status

		Cases		Controls		p
		Frequency	Percent	Frequency	Percent	
Liquor status	Clear	23	57.5	29	72.5	0.15 Not significant
	Meconium stained	17	42.5	11	27.5	
	Total	40	100.0	40	100.0	

Incidence of meconium-stained liquor amongst babies born to cases was found in to be 42.5% as compared to controls i.e., 27.5%. This difference in the proportion of meconium-stained liquor amongst cases and controls was found statistically not significant i.e. (p>0.05).

Table 6: Distribution of cases and controls according to NICU admissions

		Cases		Controls		P
		Frequency	Percent	Frequency	Percent	
NICU Admission	No	23	57.5	32	80.0	0.029 Significant
	Yes	17	42.5	8	20.0	
	Total	40	100.0	40	100.0	

Incidence of NICU admission amongst babies born to cases was found to be 42.5% as compared to controls i.e., 20%. This difference in the proportion of NICU admissions amongst cases and controls was found statistically significant i.e. (p<0.05). It means incidence of NICU admissions was significantly higher in preeclampsia cases in our study.

Table 7: Distribution of cases and controls according to maternal outcome

		Cases		Controls		P
		Frequency	Percent	Frequency	Percent	
Condition of mother at the time of discharge	stable	40	100.0	40	100.0	--

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All the mothers were stable at the time of discharge i.e. 100%

Table 8: Distribution of cases and controls according to fetal outcome

		Cases		Controls		P
		Frequency	Percent	Frequency	Percent	
Condition of baby at the time of discharge	Alive	35	87.5	38	95.0	0.23 Not significant
	Death	5	12.5	2	5.0	
	Total	40	100.0	40	100.0	

Fetal outcome in our study revealed that newborn death rate amongst cases was 12.5% as compared to 5% in controls. %. This difference in the newborn death rate amongst cases and controls was found statistically not significant i.e. (p>0.05).

Discussion

In our study, incidence of IUGR amongst cases was found to be 25% as compared to controls i.e. 0%. This difference in the proportion of IUGR babies amongst cases and controls was found statistically significant i.e. (p<0.05). It means incidence of IUGR was significantly higher in preeclampsia cases in our study.

Naga Jyothi S. *et al.* [7] reported that incidence of LBW in their study was 48.9% which is comparatively higher.

In our study, LSCS rate amongst cases was 42.5% as compared to 52.5% amongst controls. This difference in the proportion of caesarean number amongst cases and controls was found statistically not significant i.e. (p>0.05).

Patil N. *et al.* [8] reported that all the patients could be followed up to look for the pregnancy outcome. It was found that significantly more number of patients (19/30) had vaginal delivery in control group whereas only 29/70 had vaginal delivery in study group.

Naga Jyothi S. *et al.* [7] reported that maternal serum homocysteine levels did not show any correlation with mode of delivery (LSCS and vaginal delivery) which is consistent with our findings.

In our study, Incidence of LBW amongst cases was found to be 45% as compared to controls i.e. 17.5%. This difference in the proportion of LBW babies amongst cases and controls was found statistically not significant i.e. (p>0.05). It means incidence of LBW was significantly higher in preeclampsia cases in our study.

Patil N. *et al.* [8] reported that study group also had more of preterm deliveries (25/70) compared to control group (5/20).

Naga Jyothi S. *et al.* [7] reported that incidence of LBW in their study was 15.6%.

In our study, Incidence of meconium-stained liquor amongst babies born to cases was found in to be 42.5% as compared to controls i.e., 27.5%. This difference in the proportion of meconium-stained liquor amongst cases and controls was found statistically not significant i.e. (p>0.05).

In our study, Incidence of NICU admission amongst babies born to cases was found to be 42.5% as compared to controls i.e., 20%. This difference in the proportion of NICU admissions amongst cases and controls was found statistically significant i.e. (p<0.05). It means incidence of NICU admissions was significantly higher in preeclampsia cases in our study.

Patil N. *et al.* [8] reported that study group had NICU admission rate as 52.86% as compared to 10% in control group which is almost comparable with our study findings.

In our study, all the mothers were stable at the time of discharge i.e. 100%.

In our study, Fetal outcome in our study revealed that newborn death rate amongst cases was 12.5% as compared to 5% in controls. %. This difference in the newborn death rate amongst cases and controls was found statistically not significant i.e. (p>0.05).

A study was done to know the role of first trimester Homocysteine levels and pregnancy outcome by Mariano M. Patients who developed hypertensive disorders in pregnancy, oligohydramnios, meconium-stained amniotic fluid, pregnancy loss and had low birth weight babies had significantly high level of Homocysteine.9

In another study by Po-jencheng in 2016 on prognostic value of cardiovascular disease risk factors on the severity of pre-eclampsia measured in first trimester suggested that, Homocysteine related endothelial dysfunction can be a contributor for abnormal implantation which later leads to early onset preeclampsia and/or preeclampsia with
FGR [10].

Conclusion

Fetal outcome in our study revealed that newborn death rate amongst cases was 12.5%, IUGR babies 50%, LBW 45%, meconium stained liquor 42.5% and NICU admission rate as 42.5%

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