Original Article

Feto-Maternal Outcome Of Eclamptic Mothers With Posterior Reversible Encephalopathy Syndrome (Pres) At A Tertiary Care Hospital

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Abstract

Background: Eclampsia is one of the riskiest acute pregnancy issues since it has a high risk of morbidity and death for both the mother and the fetus. In underdeveloped nations, there are 50 to 151 cases of eclampsia for every 10,000 deliveries. When combined with eclampsia, reversible posterior leukoencephalopathy syndrome even makes the patient's situation worse and has a negative impact on both the mother and the fetus.

Objective: The present study was aimed to determine the obstetric outcomes for the mother and the newborns in PRES at a Federal Government Polyclinic (Postgraduate Medical Institute) Islamabad

Study design: A cross-sectional study

Place and Duration: This study was conducted in Federal Government Polyclinic (Postgraduate Medical Institute) Islamabad from December 2021 to December 2022.

Methodology: Women presenting with eclampsia having neurological symptoms were included in the study. Computed Tomography (CT) of the brain was performed forthe diagnosis of PRES. Women with known seizure disorders or having neurological disorder due to any cause other than eclampsia were excluded. After being diagnosed with PRES and informed consent maternal and fetal outcomes were recorded. Version 25 of SPSS (Statistical package for social sciences) was used to enter and analyse the data. For categorical variables, frequency and percentages as well as mean and standard deviation were collected.

Results: Postpartum presentation of eclampsia was 18(45%), 27(67.5%) were primigravida, 65% belonged to rural type of residence, only 11(27.5%) cases were booked. Headache was the most common symptom among patients (42.5%), followed by visual disturbance (27.5%). More than half of the patients (52.5%) had 1-3 convulsions. CT scan revealed that Parieto-occipital region was involved in 19 (47.5%) of patients. The most common maternal complication was Abruptio placentae 8(20%) followed by HELLP syndrome 7(17.5%). Neonatal outcomes revealed that 37.5% of neonates were low birth weight, 7.5% were stillbirthsand only 55% of neonates had APGAR scores between 7-10.

Conclusion: Among patients with PRES, prompt diagnosis and therapy are crucial for survival. Clinical and radiographic features need to be carefully considered. The neonatal outcomes also were poor in the study, therefore, a multidisciplinary management strategy will aid in improving the result.

Key Words: Eclampsia, PRES, Maternal Outcomes, Neonatal Outcomes

Introduction

Eclampsia is one of the riskiest acute pregnancy issues because it has a high risk of morbidity and death for both the mother and the fetus [1]. The reported incidence of eclampsia varies between 1.6 and 10 per 10,000 pregnancies in wealthy countries, whereas it varies between 50 and 151 per 10,000 deliveries in impoverished countries. Moreover, low-resource countries have much higher rates of maternal and newborn mortality and illness. [2]. Reversible posterior leukoencephalopathy syndrome in combination with eclampsia even worsens the patient's condition and results in poor maternal and fetal outcomes. First time in 1996, Hinchey et al identified the posterior reversible encephalopathy syndrome (PRES)[3]. It is known by many other names including PRES, hyperperfusion encephalopathy, reversible posterior leukoencephalopathy syndrome, hypertensive encephalopathy and brain capillary leak syndrome. It has been suggested that cerebral vasospasm and endothelial dysfunction lead to PRES. According to one idea, increasing systemic pressure overwhelms the cerebral vasculature's autoregulatory system [4], causing fluid to extravagate into the brain and cause hydrostatic oedema [5]. Because there are fewer adrenergic innervations and autoregulation mechanisms in the posterior cervix, its selective involvement may indicate a watershed zone [6].The present study aimed to determine the obstetric outcomes for the mother and the newborns in PRES at Federal Government Polyclinic

Methodology

This cross-sectional study was done from December 2021 to Dec 2022. Women presenting with eclampsia having neurological symptoms were included in the study. We performed a CT brain for diagnosis of PRES. Women with known seizure disorder or having neurological disorder due to any cause other than eclampsia were excluded. Using the accepted radiological criteria for PRES, radiologists made the diagnosis of PRES. As the degree of cerebral oedema grows, PRES develops a distinctive CT imaging picture with symmetrical hypodensities. The instrument used to evaluate the involvement of different brain regions was a CT scan.

After being diagnosed with PRES, women were given initial treatment, later, informed consent was obtained, and we recorded the sociodemographic factors and general history. Meanwhile, the obstetric examination was carried out, for gestational age, the amount of liquor was assessed, and fetal heart sound (FHS) was noted. Complete blood count, urine protein, liver function test (LFT), kidney function test (KFT), and blood coagulation profile like PT, INR were done in the laboratory. During labor and post-labor, we monitored the women for complications like abruptio placenta, HELLP, and death. The obstetrician on duty took the decision regarding the mode of delivery to carry out vaginal delivery, instrumental (vacuum and forceps) or lower section cesarean-section (LSCS). For the neonatal outcomes, the neonates were followed up to two weeks post-delivery. Birth weight, APGAR Scores at 5 min, early neonatal death and neonatal complications were recorded.

Version 25 of SPSS (Statistical package for social sciences) was used to enter and analyse the data. For categorical variables, frequency and percentages as well as mean and standard deviation were collected.

Results

In the present study, the mean age of the patients was 23.1 (SD ±2.9) years. Most (57.5%) of the participants were less than 20 years. Postpartum presentation of eclampsia was the highest presentation 18(45%) followed by antepartum eclampsia 15(27.5%). The least number (n=3) of participants was in age group between 32 to 45 years. Out of 40, 27(67.5%) were primigravida, 65% belonged to rural type of residence, only 11(27.5%) cases were booked. (As shown in Table I)

Headache was the most common symptom among patients (42.5%), followed by visual disturbance (27.5%) and altered sensorium (17.5%). More than half of the patients (52.5%) had 1-3 convulsions. CT scan revealed that Parieto-occipital region was involved in 19 (47.5%) patients followed by occipital involvement (40%). LSCS was the most common mode of delivery (47.5%). The mean gestational age was 34.4 ± 2 weeks(As shown inTable II). The most

common maternal complication was Abruptio placentae 8(20%) followed by HELLP syndrome 7(17.5%) and disseminated intravascular coagulation (DIC) (15%). (As shown in Table III)

The study of neonatal outcomes revealed that 37.5% of neonates were low birth weight, 7.5% were still birth, and only 55% neonates had APGAR scores between 7-10. We found that there were 14(35%) NICU admissions, 14(35%) neonates had birth asphyxia, and 2(5%) deaths were recorded. (As shown in Table 1V)

Table. I Sociodemographic Factors of the study participants

Variable	**No.**	**%**
Age (Mean ± SD 23.1 ±2.9)		
< 20	23	57.5
21–25	9	22.5
26–30	5	12.5
31–45	3	7.5
Presentation		
Antepartum eclampsia	15	37.5
Intrapartumeclampsia	7	17.5
Postpartum eclampsia	18	45
Gravidity		
Primigravida	27	67.5
Multigravida	13	32.5
Booking		
Booked	11	27.5
Un-booked	29	72.5
Residence		
Rural	26	65
Urban	14	35

Table II Distribution of maternal Symptoms

Variable	**Frequency (n=40)**	**%**
Premonitory Symptoms		
Headache	17	42.5
Visual disturbances	11	27.5
Altered Sensorium	7	17.5
Nausea &Vomiting	5	12.5
No of Convulsion		
1–3	21	52.5
4–5	14	35
≥ 6	5	12.5
Region Involved on CT Findings		
Parieto-occipital region	19	47.5
Temporo-occipital region	4	10
Cerebellum	1	2.5

Occipital	16	40
Mode of Delivery		
Vaginal Delivery	17	42.5
Vacuum	4	10
LSCS	19	47.5
Gestational age (Mean ± SD 34.4 ± 2 weeks)		
< 28 weeks	5	12.5
28–32 weeks	14	35
33-36 weeks	7	17.5
37–40 weeks	11	27.5
> 40 weeks	3	7.5
Blood pressure on admission		
140/90 to 160/110	23	57.5
> 160/110	17	42.5

Table III Maternal Complications in PRES

Maternal Complication	Frequency (n = 40)	%
HELLP syndrome	7	17.5
Acute renal failure	2	5
Pulmonary oedema	4	10
Abruptio placentae	8	20
DIC	6	15
Post-partum hemorrhage	3	7.5
Death	2	5

Table 1V Neonatal outcomes in PRES

Sr. No. Variable	**Frequency (n=40)**	**%**
Birth Weight		
LBW	15	37.5
Normal Birth Weight	25	62.5
Neonatal outcome		
Still Birth	3	7.5
Live birth	37	92.5
APGAR score		
< 3	3	7.5
3–6	15	37.5
7–10	22	55
Perinatal complication		
NICU admission	14	35

IUGR	9	22.5
Hyperbilirubinemia	12	30
Birth Asphyxia	14	35
Neonatal death	2	5

Discussion

One of the most typical medical conditions in pregnancy is a hypertensive disorder of pregnancy. PRES is one of the potentially harmful complications of eclampsia. Within the first 24 hours of being admitted, the majority of these individuals had imaging of the brain.

In the present study, the mean age of the patients was 23.1 (SD ±2.9) years. We observed that the Postpartum presentation of eclampsia was highest presentation 18(45%) followed by antepartum eclampsia 15(27.5%). In line with our findings, a study conducted in India reported that 30(47.6%) women presented with antepartum eclampsia, however, there were 26 (41.27%) women with postpartum eclampsia. In our study, 27(67.5%) were primigravida, While Deshmukh V et al reported that 75.7% were primigravida [7].

In the present study, 65% of mothers belonged to rural type of residence, on the other hand, while conducting similar study, Sardesai, S et al. [8] observed that 42.7% of subjects were from rural area, and 57.3% of subjects were from the urban locality. The distance from the standard health care facilities creates gaps in treatment and management of patients resulting in worse outcomes.

In our findings, headache was the most common symptom among patients (42.5%), followed by visual disturbance (27.5%) and altered sensorium (17.5%). The sequence of symptoms were nearly similar however, Deshmukh V et al reported slightly lesser proportion of all these symptoms, and additionally she studied epigastric pain and deep coma in her study which we didn't find [7]. According to reports, PRES is a reversible neurologic illness characterised by a variety of neurological signs and symptoms, such as headache, impaired vision or diminished visual acuity, disorders of consciousness, disorientation, seizures, and focal neurologic abnormalities [9].

Following the seizure, 81% on average of the EEGs of women with eclampsia revealed abnormalities, which in 90% of instances resolved shortly after birth[10]. Slow waves and spike discharges were the nonpathognomonic EEG findings in eclampsia patients, with slow waves most typically situated in the occipital lobe[11]. In our findings also, more than half of the patients (52.5%) had 1-3 convulsions. CT scan brain revealed that Parieto-occipital region was involved in 19 (47.5%) patients followed by occipital involvement (40%). According to Madhu Sinha et al., 19.2% of subjects had more than 6 convulsions, and 40.2% of subjects experienced 3 to 5 convulsions. [12].

In our study, LSCS was the most common mode of delivery (47.5%) and normal vaginal delivery (NVD) was 42.5% in ine with our findings, Karanth S et al. [13]reported a higher proportion of LSCS compared to NVD, as 43.3% vaginal delivery and 56.7% of LSCS in his study, however, in contrast to our observations, Fisher N et al. found higher proportion of NVD and lesser for LSCS as 55.6% vaginal delivery and 44.4% of LSCS [14].

Having not only the elevated mortality risk, eclampsia is linked to significant acute maternal problems. Acute renal failure, placental abruption, HELLP, disseminated intravascular coagulation, pulmonary edema, aspiration pneumonia, and cardiac arrest are among the severe maternal consequences that are more common in eclamptic women[15, 16]. Acute renal failure, HELLP syndrome, and placental abruption are all documented to occur more often in women whose eclampsia started before 32 weeks of pregnancy than in those whose eclampsia started later [16].

In our study, we observed that the most common maternal complication was Abruptio placentae 8(20%) followed by HELLP syndrome 7(17.5%) and DIC (15%). Deepika Pannu et al. reported slightly lesser percentage of HELLP Syndrome (13.2%) and much lower proportion of in DIC (2.4%) as complication among study subjects [17].

In eclamptic pregnancies, perinatal mortality and morbidity are still significant. The stated range of the perinatal mortality rate is 5.6% to 11.8% [18]. Fetal growth limitation, placental abruption, and severe preterm account for the majority of perinatal mortality instances[19]. Small for gestational age (SGA) and prematurity-related problems such as respiratory distress syndrome and infant mortality are more likely in neonates of eclamptic mothers[20].

In the present study, neonatal outcomes revealed that 37.5% of neonates were low birth weight, 7.5% were stillbirths, and only 55% of neonates had APGAR scores between 7-10. We found that there were 14(35%) NICU admissions, 14(35%) neonates had birth asphyxia, 2(5%) deaths were recorded. Compared to our findings, Archana et al. reported that 39.28% of babies had less than or equal to 2 kg weight. Perinatal asphyxia in 26 (41.3%) of cases, [21, 22]. Women who come with seizures should get prenatal and postpartum care according to established protocols. We recommend clinically useful postpartum follow-up for women with preeclampsia, including regular blood pressure checks, evaluation of symptoms, and avoidance of serious maternal sequelae including eclampsia.

Conclusion

Eclampsia is uncommon, yet it is a life-threatening condition. Women who come with seizures should get prenatal and postpartum care according to established protocols. Among patients with PRES, prompt diagnosis and therapy are crucial for survival. Clinical and radiographic features need to be carefully considered. The neonatal outcomes also were poor in the study, therefore, a multidisciplinary management strategy will aid in improving the result.

CONFLICT OF INTEREST

The authors declared no, conflict of interest

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REFERENCES

1. E.K. Main, C.L. McCain, C.H. Morton, S. Holtby, E.S. Lawton Pregnancy-related mortality in California: causes, characteristics, and improvement opportunities ObstetGynecol, 125 (2015), pp. 938-947

2.Bartal MF, Sibai BM. Eclampsia in the 21st century. American journal of obstetrics and gynecology. 2022 Feb 1; 226(2):S1237-53.

3. Hinchey J, Chaves C, Appignani B, et al. A reversible posterior leukoencephalopathy syndrome. N Engl J Med. 1996; 334:494–5002.

4. Mayama M, Uno K, Tano S, Yoshihara M, Ukai M, Kishigami Y, et al. Incidence of posterior reversible encephalopathy syndrome in eclamptic and women with preeclampsia with neurologic symptoms. Am J Obstet Gynecol. 2016; 215:239.e1-239.e15.

5. Junewar V, Verma R, Sankhwar PL, et al. Neuroimaging features and predictors of outcome in eclamptic encephalopathy: a prospective observational study. AJNR Am J Neuroradiol. 2014; 35:1728–34.

6. Alhilali LM, Reynolds AR, Fakhran S. A multi-disciplinary model of risk factors for fatal outcome in posterior reversible encephalopathy syndrome. J Neurol Sci. 2014; 347:59–65.

7. Deshmukh V, Gangurde VR, Gadappa S. Maternal and Perinatal Outcome of Posterior Reversible Encephalopathy Syndrome (PRES) in Patients with Eclampsia at Tertiary Health Care Centre. The Journal of Obstetrics and Gynecology of India. 2022 Aug; 72(Suppl 1):192-7.

8.Sardesai S, Dabade R, Deshmukh S, et al. Posterior reversible encephalopathy syndrome (PRES): evolving the mystery of eclampsia! J ObstetGynecol India. 2019; 69:334–8.

9. M. Fischer, E. Schmutzhard Posterior reversible encephalopathy syndrome J Neurol, 264 (2017), pp. 1608-1616

10. I.A. Brussé, N.C. Peters, E.A. Steegers, J.J. Duvekot, G.H. Visser Electroencephalography during normotensive and hypertensive pregnancy: a systematic review ObstetGynecolSurv, 65 (2010), pp. 794-803\

11.M.A. Osmanağaoğlu, G. Dinç, S. Osmanağaoğlu, H. Dinç, H. Bozkaya Comparison of cerebral magnetic resonance and electroencephalogram findings in pre-eclamptic and eclamptic women Aust N Z J ObstetGynaecol, 45 (2005), pp. 384-390

12. Sinha M, Sinha SK. Perinatal and maternal outcomes of eclampsia in Darbhanga District, Bihar, India. Int J Contemp Med Res. 2018; 5(2):B1–4.

13.Karanth S, Gonsalves K, Sheela CN, Mathew R, Sarma GRK, Phillip B, et al. Maternal and perinatal outcome in eclampsia complicated by posterior reversible encephalopathy syndrome; a three years' experience in a tertiary care hospital. Int J ReprodContracept Obstet Gynecol. 2017; 6:5044–50.

14. Fisher N, Saraf S, Egbert N, Homel P, Stein EG, Minkoff H. Clinical correlates of posterior reversible encephalopathy syndrome in pregnancy. J Clin Hypertens. 2016; 18(6):522–7.
15.L. Ghulmiyyah, B. Sibai Maternal mortality from preeclampsia/eclampsia Semin Perinatol, 36 (2012), pp. 56-59
16.F. Mattar, B.M. Sibai Eclampsia. VIII. Risk factors for maternal morbidity Am J ObstetGynecol, 182 (2000), pp. 307-312
17. Pannu D, Das B, Hazari P. Shilpa, Maternal and perinatal outcome in eclampsia and factors affecting the outcome: a study in North Indian population. Int J Reprod Contracept Obstet Gynecol. 2014; 3(2):347–51.
18. S. Liu, K.S. Joseph, R.M. Liston, et al. Incidence, risk factors, and associated complications of eclampsia ObstetGynecol, 118 (2011), pp. 987-994
19.A.G. Witlin, G.R. Saade, F. Mattar, B.M. Sibai Predictors of neonatal outcome in women with severe preeclampsia or eclampsia between 24 and 33 weeks' gestation Am J ObstetGynecol, 182 (2000), pp. 607-611
20.N. Jaatinen, E. Ekholm Eclampsia in Finland; 2006 to 2010 Acta ObstetGynecolScand, 95 (2016), pp. 787-792
21. Kumari A, Mundle S, Fuse S. Maternal and neonatal outcome in eclampsia in a tertiary care hospital India. JMSCR. 2017; 05(06):23522–33.
22. Konar H, Agarwal L, Priyanka P, Chaudhuri S. Management of posterior reversible syndrome in preeclamptic women. J ObstetGynaecol India. 2021; 71(3):318–21.