

Clinical and Radiological Features of Posterior Reversible Encephalopathy Syndrome in Patients with Antepartum Eclampsia

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Abstract

Objectives: Incidence of eclampsia in the western world is 1 in 2000 and 1 in 3448 pregnancies, but it is many times high in developing countries with incidence of 1.5% in India. Posterior Reversible Encephalopathy Syndrome (PRES) also known as reversible posterior leukoencephalopathy syndrome occurs in association with a number of causes, most commonly hypertension, pre-eclampsia/eclampsia and renal injury. Aim of the study was to find about the incidence of PRES in patients with antepartum eclampsia by brain imaging using MRI and MRV.

Material and methods: It was a retrospective cohort study of all patients of antepartum eclampsia with PRES syndrome over a period of two years from 1st June 2017 to 31st July 2019 managed at Basaveshwar Teaching and General Hospital, attached to Mahadevappa Rampure Medical College, Kalaburagi, Karnataka, India.

Results: A Total of 140 patients with antepartum eclampsia delivered at Basaveshwar Teaching and General Hospital, attached to Mahadevappa Rampure Medical College, Kalaburagi, Karnataka during the study period; that is between 1st June 2017 and 31st July 2019. Of these 14 patients had PRES with an incidence of 10% of all patients with antepartum eclampsia. The incidence was more in primigravidas (78%) than in multigravidas (22%). 10 patients were 20–25 age group, 13 presented with multiple seizure episodes. In 12 patients seizures were controlled only with MgSO₄. Mode of delivery was by vaginal route in

5 patients. Perinatal mortality was seen in 5 patients. There was no maternal mortality in our study.

Conclusion: Incidence of PRES was 10% amongst the patients delivered with antepartum eclampsia at Basaveshwar Teaching and General Hospital, Kalaburagi. Signs of imminent eclampsia headache, epigastric pain and blurring of vision were present in these patients. In the majority of the patients seizures were controlled with MgSO₄ alone. MRI and MRV were the investigation of choice. Prognosis of PRES in patients with antepartum eclampsia was favorable.

Keywords: PRES; Antepartum eclampsia; MRI; MRV.

Introduction

Incidence of eclampsia in the western world is 1 in 2000 and 1 in 3448 pregnancies, but it is many times higher in developing countries with an incidence of 1.5% in India. Depending on the time of occurrence of convulsions before, during or after labor, eclampsia is designated as antepartum, intrapartum or postpartum.^{1,2} The frequency of timing of eclampsia reported in literature ranges from 38 to 53% antepartum, 15 to 20% intrapartum and 11 to 44% in the postpartum period. Most antepartum eclampsia occurs in the third trimester (90%). Posterior reversible encephalopathy syndrome (PRES) is a clinicoradiologic syndrome characterized by the presence of severe headache,

visual impairments, convulsions and altered sensorium.³⁻⁵ PRES is mostly associated with hypertension, pre-eclampsia/eclampsia and acute renal injury. Our aim of the study was to study the clinical and radiological features, associated complications and outcome of the patients of antepartum eclampsia who had PRES.⁶

Materials and Methods

It was a retrospective cohort study of all patients of antepartum eclampsia with PRES syndrome over a period of two years from 1st June 2017 to 31st July 2019 managed at Basaveshwar Teaching and General Hospital attached to Mahadevappa Rampure Medical College Kalaburagi, Karnataka, India.

Results

A total of 140 patients with antepartum eclampsia delivered at Basaveshwar teaching and General Hospital, Kalaburgi during the study period; that is between 1st June 2017 and 31st July 2019. Of these 14 patients had PRES with an incidence of 10% of all patients with antepartum eclampsia. The incidence was more in primigravidas (78%) than in multigravidas (22%). Most patients were of younger age group with 71% cases between age group of 20 and 25. There were no cases seen in teenage pregnancy and above 35 years of age. The demographic factors are summarized in Table 1.

Most of the patients were between 34 and 37 weeks of gestation (71%), summarized in Table 2. Symptoms of imminent eclampsia were present in

Table 1: Demographic factors

Parameters	No. of patients
Age	
<20	0
20-25	10
26-30	2
31-35	2
>35	0
Parity	
Primigravida	11
Multigravida	3

12 patients with headache being the most common (50%). Clinical features are summarized in Table 3.

Thirteen patients presented with multiple seizure episodes (92%). In 12 patients seizures were controlled only with MgSO₄ (85%). The remaining

Table 2: Gestational age distribution

Gestational Age	Incidence
<30	1
30-33	1
34-37	10
>37	2

Table 3: Clinical features

Parameters	No. of patients	Parameters	No. of patients
Headache/vomiting	7	Abruption	1
Epigastric pain	3	DIC	1
Hypertension/Proteinuria	13	HELLP	1
Visual disturbances	2	Pulmonary edema	0
Seizures		ARF	0
1	1	Encephalopathy	
2-4	7	Anemia	4
>4	5	Vomiting	3

Table 4: Treatment given

Parameters	No. of patients
MgSO ₄	14
Mannitol	9
Labetelol	9
Nifedipine	5
Levipill	13
Eptoin	2

2 patients required phenytoin sodium due to recurrent seizures not controlled by MgSO₄, while Levipill was used in 13 cases for seizure control. Treatment given is summarized in Table 4.

MRI changes observed according to different areas of brain involved are summarized in Table 5. Mode of delivery was by vaginal route in 5 patients (35%), while remaining 9 patients were delivered

Table 5: Site of lesion in MRI

Site of lesion	No. of patients
Occipital lobe	8
Parietal lobe	1
Temporal lobe	1
Frontal lobe	-
Basal ganglia/cerebellum	2
Multiple areas	2

Table 6: Mode of delivery

Parameters	No. of patients
Vaginal	5
LSCS	9

by LSCS (65%), summarized in Table 6. Perinatal mortality was seen in 5 patients (35%). There was no maternal mortality in our study.

Discussion

PRES was described for the first time in 1996 by Hinchey et al. It is clinicroadiologic syndrome characterised by the presence of severe headache, visual impairments, convulsions and altered sensorium.^{3,4,7} It is mostly associated with white matter edema involving the posterior portions of cerebral hemispheres bilaterally and also with additional findings of areas of petechial hemorrhage and ischemia.⁸ Findings of PRES is mostly seen with severe preeclampsia, eclampsia, hypertensive encephalopathy, metabolic disorders, cerebral vasculitis, cytotoxic medications, infections with sepsis, acute renal injury.⁹

PRES is usually reversible with appropriate treatment. It is necessary to investigate and treat the underlying cause responsible for

PRES. The reversibility of PRES is due to its underlying pathophysiology, which is due to abnormal cerebral autoregulation and endothelial dysfunction. Posterior predominance of brain lesions is more because of the fact that anterior circulation of the brain is much better supplied with sympathetic innervations and therefore better protected against the effects of elevated blood pressure than the posterior part of the brain. In these cases, vasogenic edema is the result of forced leakage of serum through the capillary walls due to increased perfusion pressure that is mainly a result of systemic arterial blood pressure. Generalized seizures are often the most common clinical presentation of PRES, but there can also be signs of headache, nausea, vomiting and altered sensorium. Visual disturbances ranging from blurring of vision to complete cortical blindness can be presented. Hypertension is associated with the majority of cases, but it can also be normal or slightly elevated in up to 20–30% cases. MRI is the imaging modality of choice. MRI shows symmetrical white matter edema in the posterior cerebellar hemispheres that particularly involve the parieto-occipital regions

bilaterally. T2-weighted MRI shows areas of hyperintense signal and is thought to capture the images with the best quality, but fluid attenuated inversion recovery (FLAIR) sequences may improve detection of cortical-subcortical areas of injury and help distinguish vasogenic edema from cytotoxic edema. MRV tends to be normal in PRES. MgSO₄ is the treatment of choice in eclampsia. Blood pressure should be controlled by iv labetalol or oral nifedipine. In cases of status eclampticus, i.v lorazepam is used along with invasive ventilation and other general measures. Prompt delivery is indicated once the patient is stabilized. The mode of delivery is usually determined according to obstetric indications. The prognosis of PRES is usually benign and in most cases neurological symptoms and cerebral lesions disappear with treatment. Control of blood pressure is vital to avoid irreversible damage to the central nervous system.

Conclusion

We emphasize that prompt recognition and treatment is important in preventing permanent neurologic damage that can occur in this otherwise typically reversible condition; and in most cases of PRES, cerebral lesions and neurologic symptoms disappear with aggressive control of blood pressure and treatment of seizures.

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