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RESEARCH ARTICLE

ASSESSMENT OF CLINICAL SPECTRUM OF POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME (PRES) AMONGST PATIENTS OF ECLAMPSIA

Kinjalben A. Savani[1], Chandani Mehta[2] and Avan A. Savani[3]

[1]M.S. (Obstetrics & Gynecology), Consultant obstetrician and Gynecologist, Satnami Hospital, Ahmedabad, Gujarat; [2] M.S. (Obstetrics & Gynecology), Department of Obstetrics and Gynecology, Assistant Professor, B.J. Medical college, Ahmedabad, Gujarat; [3]M.B.B.S., Junior Resident, GMERS Hospital, Vadnagar, Gujarat

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Corresponding author:
Kinjalben A. Savani

ABSTRACT

Background: With availability of neuroimaging, it is possible to know the exact underlying CNS pathology in eclampsia and thus therapy can be targeted at the same. This study was undertaken to assess clinical spectrum of PRES syndromes amongst patients of eclampsia. **Objective:** The aim of present study is to assess clinical spectrum of PRES syndrome amongst patients of eclampsia. **Methodology:** This observational study was carried out in department of Obstetrics & Gynaecology at Sir T Hospital, Bhavnagar from june 2020 to September 2021. A total of 36 patients who were admitted for eclampsia were studied. After stabilisation of patients, a detailed history and examination of patients done and patients were sent for MRI and findings of PRES were studied. **Results:** Majority of patients were in the age group of 20-24 years. Maximum incidence was seen with primigravida (66.7%). Almost all patients of eclampsia were presented with generalized tonic clonic convulsions (88.5%) followed by headache (52.7%). Majority of patients were admitted with systolic blood pressure of ≥161 mmHg. 94.4% women with eclampsia had PRES in MRI. Occipital lobe of brain (77.7%) is mostly affected followed by parietal lobe (69.4%). Convulsion (88.2%) is most common in PRES followed by headache (55.8%). There was case fatality rate of 5.56% in this study with 2 maternal mortality. Most of neonates were admitted in NICU (42.7%) because of prematurity. **Conclusion**: Diagnosis of eclampsia is clinical and involving neuroimaging. The characteristic imaging findings and high index of clinical suspicion along with radiological correlation, will help in early recognition and prompt management of PRES, which will aid in preventing grave complications.

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INTRODUCTION

Hypertensive disorders of pregnancy include Pregnancy induced hypertension (PIH), Preeclampsia, and Eclampsia. 10% of all pregnancies are complicated by hypertension. In 1619, Varandaeus coined the term *ECLAMPSIA* in a treatise of gynecology. In majority of cases, eclampsia preceded by features of preeclampsia which is defined as new onset of high blood pressure of more than 150/100 mmHg associated with proteinuria or end organ damage after 20 weeks of gestation. When preeclampsia is complicated by new onset of generalized tonic-clonic convulsion and/or unexplained coma that cannot be attributed to other causes is termed as eclampsia (9). The incidence of eclampsia is around 1.5% in India. Poor obstetric care is largely responsible for the high rates of eclampsia in low resource countries. However, what triggers the occurrence of convulsion in preeclamptic patients still remains a mystery!!! The term Posterior Reversible Encephalopathy Syndrome (PRES) was first coined by Hinchey *et al*. in 1996. It presents with rapid onset of symptoms such as: nausea, headache, altered consciousness, visual disturbances, blurred vision, hemianopia, and other focal neurological deficits as well as seizures. Generalized seizures are often most common manifestation of PRES.

It is usually associated with late eclampsia and a high rate of cortical visual loss in these patients. In preeclampsia and eclampsia, the incidence of posterior leukoencephalopathy syndromes not precisely known. Many smaller studies recorded that almost 100% of eclamptic women had PRES. Though clinical symptoms of PRES resolves within weeks, sometime irreversible neurological deficit occurs if immediate intervention is not done. It is important to recognize this condition as early as possible. Controlling of BP helps in early reversal of symptoms, and minimizes long term sequale.

Ischemic infarcts and hemorrhages are the complications which lead to persistent neurological deficit. This study is designed to assess clinical spectrum of PRES in neuroimaging finding (MRI) in patients of eclampsia. MRI findings in most of women with PRES include T2 hyperintensity in affected regions.

It suggests subcortical edema predominantly in occipital lobes and parietal lobes. However, PRES is rarely limited to posterior white matter and can occur in the cortex, frontal lobes, basal ganglia, and brain stem, with trend suggesting basal ganglia involvement in eclamptic patients.

MATERIAL AND METHODOLOGY

After informed written consent in vernacular language from all the patients, this observational study was carried out at Department of Obstetrics &Gynecology from June 2020 to September 2021 at Government Medical College and Sir T. General Hospital, Bhavnagar, Gujarat. All patients of eclampsia presented in labour room were included as cases in our study.

Inclusion criteria

- Pregnant women of >24 week with Hypertension and proteinuria that cannot be attributed other causes
- Women with antepartum or intrapartum or postpartum convulsion.

Exclusion criteria

- Patient having known case of neurological problems i.e. Epilepsy, meningitis, space occupying lesion etc.
- History of autoimmune disorder, taking cytotoxic drugs, diabetes and chronic renal failure etc.

STUDY DESIGN: A total of 36 antenatal and postnatal eclampsia patients who were admitted during our study period were taken in study. All patients of eclampsia who fulfilled the inclusion and exclusion criteria were first stabilized with magnesium sulfate and anti-hypertensives according to blood pressure. A detailed history was taken including age, registration of pregnancy, socio-economic status, presenting complaints, obstetric and menstrual history was taken. Antenatal visits were noted. General examination done which include state of consciousness and vitals especially maternal pulse and blood pressure on admission. Presence of pallor and pedal edema were looked for. Urine albumin was done to look for proteinuria. Systemic examination included cardiovascular, respiratory systems and CNS systems. Per abdomen examination done to watch for fetal well-being. Single pelvic examination was done to note Bishop's score, adequacy of pelvis, and assessment of CPD. Investigations like complete blood count, differential count, renal function test, liver function test, coagulation profile were done. Ophthalmological examination was done for papilloedema and retinopathy. Depending upon Bishop's score, decision for induction of labour or cesarean section taken. After delivery when patient stabilize, MRI brain (neuroimaging study) done for all patients and radiological features noted were recorded. The images were interpreted by the radiologist. Maternal and fetal outcome were noted at the time of discharge. All the data collected and results were interpreted in percentages on the basis of above statistical analysis.

RESULTS

A total of 36 women with eclampsia were admitted during study period from which data were analysed and results given.

Demographic data

Age group	Antepartum eclampsia	Postpartum eclampsia
≤19 years	1 (3.8%)	0
20-24 years	14 (51.8%)	6 (66.67%)
25-29 years	8 (29.6%)	2 (22.23%)
≥30 years	4 (14.81%)	1 (1.11%)
Total	27 (100%)	9 (100%)

Majority of the participants were in the age group of 20-24 years of age i.e. 55.56% followed by 27.7% in the age group of 25-29 years. 69.44% patients are belonged to the lower socioeconomic class, 25% to middle, 5.55% belonged to upper socioeconomic class.27 (75%) cases were antepartum eclampsia while 09 (25%) cases were postpartum eclampsia. Out of 27 cases antepartum eclampsia, 51.8% had age group between 20-24 years and 29.6% had age group of 25-29 years. Similarly, out of 09 postpartum eclampsia cases 66.67% had age group of 20-24 years and 22.23% had age group of 25-29 years.

Gestational age in antepartum eclampsia

Gestational age at onset of eclampsia	No. of patients
<28 weeks	2 (7.4%)
28-34 week	11 (40.74%)
34-37 week	5 (18.51%)
>37 week	9 (33.33%)

Out of 27 antepartum eclampsia cases, 40.74% (11) having onset of antepartum eclampsia at gestational age of 28-34 weeks and 33.33% (09) had gestational age >37 weeks.

Sensorium at time of presentation

Clinical presentation	Antepartum	Postpartum
Unconscious	5 (18.51%)	2 (22.23%)
Altered sensorium	2 (7.4%)	4 (44.45%)
Conscious	20 (74.07%)	3 (33.34%)

In this study, 19.45% eclampsia patients were presented with unconsciousness, 16.67% had altered sensorium and majority of patients (63.88%) were conscious.

Clinical symptoms at time of presentation

Symptom	Antepartum	Postpartum
Headache	15	4
Nausea & Vomiting	11	3
Convulsion	24	8
Blurring of vision	9	5

Commonest presenting complaint in antepartum and postpartum eclampsia patients was convulsion (88.88%). Single patient can present with many symptoms. Next common symptom is headache which is 55.5% in antepartum eclampsia and 44.44% in postpartum eclampsia. It is observed that nausea, vomiting and blurring of vision were the other symptoms of eclampsia- 40.74% and 33.33% in antepartum eclampsia while 33.33% and 55.55% in postpartum eclampsia respectively.

MRI finding

MRI finding	Antepartum eclampsia	Postpartum eclamspia
PRES	25 (92.6%)	9 (100%)
Other than PRES	2 (7.4%)	0

Posterior reversible encephalopathy syndrome (PRES) is a specific radiological finding which is found in 94.44% (34) of women. Out of which, antepartum eclampsia women had higher number (25) than postpartum eclampsia (09). 100% of postpartum eclampsia women had PRES. Only 7.4% antepartum eclampsia women had not PRES.

Brain area involved in PRES

Brain area involved	PRES
Occipital	28 (77.7%)
Parietal	25 (69.4%)
Frontal	9 (25%)
Temporal	13 (36.11%)

Single patient can have involvement of many lobes of brain. Most common lobe of brain involved is occipital lobe (77.7%). 2nd most common lobe involved is parietal lobe which is in 69.4% of PRES patients. Temporal and frontal lobe involvement is 36.1% and 25% respectively. In this study no any other areas of brain involvement was found.

Mode of delivery

Mode of delivery	Antepartum eclampsia	Postpartum eclampsia
Vaginal	11 (41%)	6 (67%)
LSCS	16 (59%)	3 (33%)

Mode of delivery was vaginal in 48% and LSCS in 52% for obstetric indication.

Maternal outcome

Maternal outcome	Antepartum eclampsia	Postpartum eclampsia
Stable and discharged	25 (92.6%)	9 (100%)
Maternal death	2 (7.4%)	0

There were 2 maternal mortalities (5.56%) in our study. Both of which are patient having antepartum eclampsia. All postpartum eclampsia patients are stabilized and discharged.

Fetal Outcome

Outcome	Number
Well breastfed	12 (33.34%)
NICU admission	17 (47.22%)
Stillbirth	4 (11.11%)
Expired	3 (8.33%)

In our study, there were more number of NICU admission amongst neonates, it was about 47.22%. 12(33.34%) Neonates were with mother and well breastfed. 4 (11.11%) were stillborn and 3 (8.33%) were expired.

DISCUSSION

Mean age of our study population was 24.38. This result is comparable with other study like Ugran SM *et al*.(8) where mean age group was 23.89 years. Most cases presented in third trimester. 40.74% had gestational age of 28-34 weeks. Bhanu BT *et al*.(1) reported that most cases are presented in 34-37 weeks of gestation. On examination most patients were conscious (63.88%). 16.67% patients had altered sensorium and 19.45% patients presented with unconsciousness. Altered sensorium is more common in postpartum eclampsia patients in our study. Convulsion is usually present in eclampsia and headache is significant symptom of PRES. A similar study Mishra R.(6), Fisher *et al*.(2) and Sardesai *et al*.(7) reported that headache was most common symptom in PRES followed by blurred vision. 94.4% patients had PRES on MRI. 5.56% had findings other than PRES (cerebral edema, demyelination and meningoencephalitis). All postpartum patients of eclampsia had PRES on MRI findings which is almost similar to findings of Sardesai *et al*.(7) which reported that 100% patients were found to have PRES on MRI. In this study the commonest lobe involved was occipital (77.7%) followed by parietal (69.4%), temporal (36.11%), and frontal (25%). It is similar to study by Alexander *et al*.(5) and Sardesai *et al*.(7). Fisher *et al*.(2) reported that occipital and parietal followed by frontal and temporal. Out of 36 patients, 17 delivered vaginally, and 19 delivered by LSCS. In Fisher *et al*.(2) and Mahalakshmi *et al*.(4) Study LSCS is more common than Vaginal delivery. 2 (6%) mothers expired of eclampsia with PRES. Both of these patients are of antepartum eclampsia, which is almost similar to Bhanu BT *et al*.(1) (5.7%) and Mahalakshmi *et al*.(4) (6.9%). Majority of neonates (47.2%) were admitted in NICU and 33.34% neonates were motherside. There were 19.44% perinatal mortality in our study. It was mainly due to prematurity. Which is almost similar to Karanth S *et al*.(3) study.

CONCLUSION

- Eclampsia still remains a major cause for maternal morbidity and mortality. But it is preventable. Its diagnosis is clinical and involves neuroimaging.
- Neuroimaging may be indicated in all patients of eclampsia, specific attention has to be given to atypical cases who are resistant to anticonvulsant therapy.
- More awareness should be created for women while attending the antenatal visits. Women from low socioeconomic status should be educated about nutrition, pregnancy care, information about premonitory symptoms and the need for regular antenatal and postnatal checkups with close monitoring.

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Glossary of abbreviations

CNS: Central nervous system
CPD: Cephalo-Pelvic disproportion
LSCS: Lower segment caesarean section
MRI: Magnetic resonance imaging
NICU: New born intensive care unit
PIH: Pregnancy induced hypertension
PRES: Posterior Reversible Encephalopathy Syndrome

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