



## A STUDY OF POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME (PRES) IN PREGNANCY

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### ABSTRACT

**Aim:** To study the clinical features, etiology and radiological presentations of posterior reversible encephalopathy syndrome in pregnancy.

**Methods:** After the institutional ethical committee approval this study was done in a tertiary medical college hospital in all the pregnant patients admitted with complains suggestive of PRES during January 2013 to January 2015 were included in this study. The demographic data and the clinical features were carefully noted. MRI brain was done for all patients and the radiological features were recorded and the etiology was confirmed in each case. The treatment given and the clinical outcome after treatment were noted.

**Results:** PRES when it occurs, commonly affects the primigravida. 95% of patients in our study were primigravida. Mean age of occurrence was 26 yrs. Head ache is the commonest presenting symptom. Next common symptom was seizure followed by vomiting, visual complaints and impaired consciousness. Only 50% of the patients had documented hypertension. Papilledema was found in two of the patients. No focal deficits were noted in any of the patients. Vasogenic edema was seen in MRI brain imaging predominantly involving the bilateral Parieto-occipital regions. In all patients symptoms and signs were reversible following treatment.

**Conclusion:** Pregnancy induced hypertension is the commonest cause of PRES and primigravida are more vulnerable. PRES is reversible if recognized early and appropriate treatment is initiated.

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### INTRODUCTION

Posterior reversible encephalopathy syndrome was first described in 1996 as a clinical entity with sudden onset of head ache, altered sensorium, seizure and visual symptoms, sudden raise in patient's blood pressure, drugs like cyclosporine, sepsis are the causes implicated in development of Posterior reversible encephalopathy syndrome<sup>1</sup>. The commonest cause of PRES is pregnancy induced hypertension, eclampsia and Pre-eclampsia<sup>5,6</sup>.

Vasogenic edema of the brain is the underlying pathophysiology of PRES where there is extravasation of the fluid into the interstitium that occurs following sudden hypertension, subsequent vasodilatation and hyper perfusion<sup>2, 3, 6</sup>. Paucity of the protective autonomic regulation in the posterior regions of the brain predisposes these areas to PRES. Drugs commonly implicated in causing PRES are immunosuppressants like cyclosporine, tacrolimus, cisplatin, high dose steroids, interferons, rituximab and antibiotics like linezolid<sup>4,5</sup>. These drugs either cause sudden raise in BP or

cause damage to the endothelium. Sepsis also causes PRES due to endothelial damage.

The radiological feature of vasogenic edema is iso or hyper intensity in DWI and hyper intensity in ADC<sup>1,2</sup>.

The corner stone treatment of PRES in pregnancy is magnesium sulphate, which controls BP as well as seizure. In eclampsia there is intense vasoconstriction in the brain, the hypothalamus when ischemic discharges sympathetic signals causing hypertensive crisis. Magnesium sulphate is a good cerebral vasodilator hence it decreases ischemia of hypothalamus, in turn reduces the sympathetic outflow therefore blood pressure reduces. When cerebral ischemia lessens seizure also reduces.

Other drugs used are anticonvulsants like phenytoin especially when patient is oliguric where magnesium sulphate is contraindicated. Anti hypertensives like methyldopa and nifedipine are also frequently used in the control of hypertension.

PRES is reversible when blood pressure is promptly controlled or when the offending drugs is stopped. However delay in

treatment can cause irreversible complications like cerebral infarction, hemorrhage, brain herniation and death. Early recognition of the symptoms of PRES and early treatment will be lifesaving.

## MATERIALS AND METHODS

This is a descriptive study done in pregnant patients admitted with clinical features suggestive of Posterior reversible encephalopathy syndrome in the obstetric wing at RSRM hospital attached to Government Stanley medical college hospital between January 2013 to January 2015.

### Inclusion criteria

Pregnant patients admitted with clinical signs, symptoms and findings suggestive of PRES

### Exclusion criteria

Patients who are not pregnant

Clinical features in pregnant patients not consistent with PRES

## METHODOLOGY

- Consent to participate in the study was taken from the patients.
- A descriptive study analyzing the medical records of patient diagnosed to have PRES over a period of 2 years was done.
- Demographic data of the patients was obtained.
- The clinical features with which the patients presented were carefully noted.
- The MRI brain was done for all patients and the radiological features noted were recorded. The images were interpreted by the radiologists at Government Stanley medical college and Hospital.
- The underlying cause or etiology of Posterior Reversible Encephalopathy Syndrome was identified and noted in each case.
- The treatment given and the clinical outcome after treatment were noted.
- Persistent neurological deficit if any was recorded.

### Observation and results

The age group affected was between 19 years and 27 years in this study with a mean of 24.34 years (Fig 1).

Fig 1 Distribution of Age

Age	No of patients
< 20	3
20-25	12
> 25	5

Among the twenty patients diagnosed with PRES one (5%) was second gravida and the rest were primi gravida (95%). Out of twenty patients ten (50%) had ante partum eclampsia, six (30%) had preeclampsia and four patients (20%) had post partum eclampsia (Fig 2).

Fig 2 Distribution of types

	No of patients
Pre Eclampsia	6
Antepartum- Eclampsia	10
Postpartum Eclampsia	4

Documented hypertension was noted in nine out of twenty patients (45%).

Most common presentation of PRES in our study was seizures. Seizures were present in fourteen patients which accounted to 70% among which 10 patients (10/14) had antepartum seizures and four (4/14) had postpartum seizures.

Other presentations were impaired consciousness which was seen in eight patients (50%), visual symptoms were present in ten patients (50%) and vomiting noted in ten patients (50%)(Fig 3).

Fig 3 Other presentations

Other presentations	No
Impaired consciousness	8
Visual symptoms	10
Vomiting	10

Vasogenic edema was the prime radiological finding of PRES. The commonest area involved was in the parieto-occipital region seven out of twenty (35%), Occipital lobe in seven (35%), parietal lobe involvement noted in five out of twenty (25%) and one patient (5%) had frontal lobe involvement (Fig 4).

Fig 4 Involvement of Lobes

Lobes involved	No
Only Occipital	7
Only Parietal	5
Parieto-occipital	7

One patient did not have any MRI changes, four patients had temporal lobe changes and one had frontal lobe change in addition to parieto-occipital changes.

Diffusion restriction was seen in two patients (10%) out of twenty, in one patient it was seen in parietal lobe (5%) and the patient had occipital lobe (5%) involvement.

Symmetrical lesion was found in eight among twenty (40%) and asymmetrical lesion was found in twelve (60%) patients.

All had subcortical white matter changes, 4 of patients had both sub cortical and cortical changes.

On examination Papilledema was seen in only 2 patients out of the 20 (10%).

### Statistical analysis

The data collected as per the proforma entered and tabulated using Microsoft office Excel 2010 version following which analysis was done and results were obtained.

## DISCUSSION

The incidence of Posterior Reversible Encephalopathy Syndrome (PRES) is common in female as most cases of PRES are associated with pregnancy. The commonest radiological pattern is subcortical, symmetrical vasogenic edema in the occipito-parietal regions. Prompt control of blood pressure prevents irreversible complications. In this study Posterior Reversible Encephalopathy Syndrome was seen between the ages 20 – 39 years with the mean of 26.34 years.

In this study all the patients affected with PRES were primi gravida except one, who developed PRES in the second gravida. Headache was the commonest presenting symptom in this study. All the patients with PRES in this study had headache. Next common symptom was seizures followed by visual complaints and vomiting. However most of the other

studies have recorded impaired consciousness as the commonest symptoms<sup>2, 6, 9</sup>.

Documented hypertension was seen in nearly 50% of the patients in our study where as in other studies it was between 68% and 82%<sup>1, 2, 7</sup>. Vasogenic edema was the MRI brain finding in these patients with PRES. Commonest lobes involved were occipital and parietal lobes. All the symptoms and signs were reversible following treatment with anti-hypertensives, MgSO<sub>4</sub>, and termination of pregnancy<sup>9, 10, 11, 12</sup>.

There were no deaths in our study and also there was no persistent neurological deficit or sequelae.

## CONCLUSION

The commonest cause of PRES is pregnancy induced hypertension, primi gravida are more susceptible. Headache seizures, blurring of vision and vomiting are the commonest symptoms. On examination papilledema may be seen. Vasogenic edema is seen in brain imaging, commonly involving the occipital and parietal regions. With prompt recognition of this syndrome and initiation of appropriate treatment the symptoms and signs are reversible and lifesaving.

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