ORIGINAL RESEARCH PAPER

Ophthalmology

KEY WORDS: Gestational Hypertension, Pres Syndrome, Neuro-ophthalmology

GESTATIONAL HYPERTENSION WITH PRES SYNDROME - CASE SERIES

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ABSTRACT

Posterior reversible encephalopathy syndrome (PRES) was first described in 1996 by Hinchey et al[1]. The PRES is a neurological disorder of acute onset characterized by headache, impaired visual acuity, visual field defect, confusion, seizures, disorders of consciousness and focal neurological deficit. PRES was previously known as Reversible posterior cerebral edema syndrome, reversible occipital parietal encephalopathy, reversible posterior leuco-encephalopathy syndrome. PRES is an obstetric emergency frequently occurring in pregnant or puerperal women in first 48 hours postpartum period with eclampsia characterized by generalized convulsion in Preeclamptic syndrome of proteinuria and hypertension. The incidence of PRES in women with preeclampsia is approximately 20 percent [2]

AIM: To report two cases of gestational hypertension presented with PRES syndrome reported in Ophthalmology department in tertiary care centre

MATERIALS AND METHODS: Two women with gestational hypertension manifested with PRES (Posterior Reversible Encephalopathy Syndrome) when they presented to the emergency of the Department of Obstetrics and Gynecology in a Tertiary Care Hospital.

RESULT : In these two patients, Ophthalmic manifestations of PRES Syndrome were studied. The initial presentation, progress of the illness, response to treatment and final outcome after a specific period of follow-up were studied in these patients.

INTRODUCTION:

PRES is manifested clinically by headache, seizures, altered mental status and retro-geniculate visual loss, with scattered foci of high T2/ FLAIR signal intensity without restricted diffusion, reflecting vasogenic edema. If this condition is left untreated, cytotoxic edema and irreversible brain injury may occur

CASE 1:

A nineteen year old primi-para, a case of severe Preeclampsia for 1 day duration was delivered by emergency LSCS. Suddenly she complained of blurring of vision both eyes and altered sensorium on her first postoperative day. She had history of pedal edema for 1 month, no elevated BP and had ophthalmology consultation when she was 36 weeks. Visual acuity was RE 6/9, LE 6/9 and fundus examination was BE media clear, disc & vessels normal, background retina normal and foveal reflex was present in both eyes.

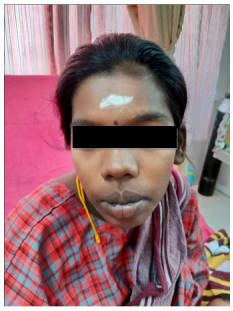
On her 1st Post Operative day, her blood pressure was 170/ 110 mm Hg, she was treated with Magnesium Sulphate and Tablet Labetolol 100 mg twice daily. On examination, her bedside vision could not be elicited as she was disoriented. Both eyes anterior segment were found to be normal. Bilateral fundus examination revealed Right Eye – Retinal edema more than 2 Disc diopter size involving macula, Left Eye – Retinal edema more than 2 Disc Dioptre size involving nasal retina. She was diagnosed as a case of Bilateral Serous Retinal Detachment secondary to severe Pre-eclampsia. She was started on Flurbiprofen eye drops four times daily in both eyes.

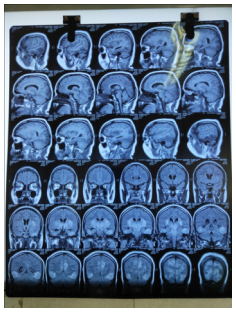
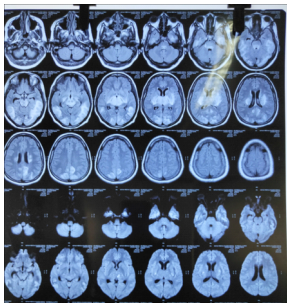
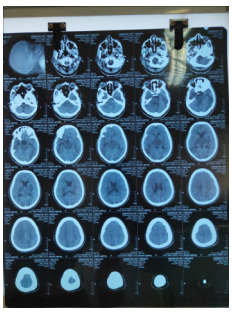
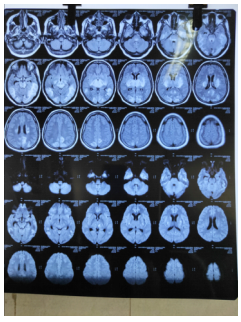
Her MRI Brain revealed T2 FLAIR hyperintensity noted in Bilateral corona radiata, basal ganglia, thalamus, midbrain, parieto occipital region, temporal region with focal areas of diffusion restriction noted in both basal ganglia & left thalamus. Foci of blooming in left thalamus consistent with hemorrhage. Magnetic Resonance Angiography (MRA)& Magnetic Resonance Venography (MRV) showed no significant abnormality, no evidence of Cerebral venous thrombosis. She was diagnosed as a case of Atypical PRES by the Neuro-physician and was started on Tablet Levatiracetam 500 mg thrice daily.

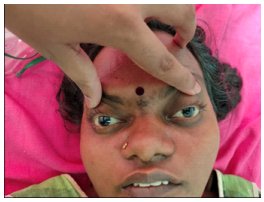
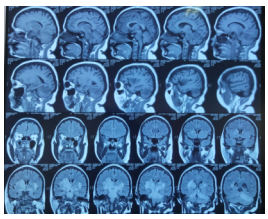
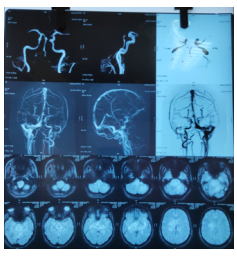
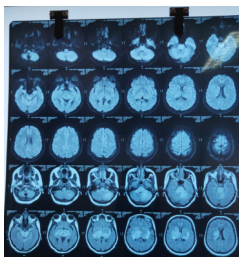
Her blood investigations were as follows

Test	On the day of surgery	Second Post-operative day
Hemoglobin (g/dl)	10.2	9.4
Total Count (Cell/ cu.mm)	14,200	15,700
Platelets (Cells/ cu.mm)	1,56,000	1,56,000
Total Bilirubin (mg/dl)	0.5	0.7
SGOT (unit/L)	43	35
SGPT (unit/L)	16	12
ALP (IU/L)	72	144
Total Protein (g/dl)	5.2	2.9

On 4th post operative day, her vision bedside was 3/60 in both eyes , fundus examination revealed mild retinal edema less than 1 disc diopters not involving macula in right eye and mild retinal edema less than 1 disc diopters not involving macula in left eye. At six weeks follow up, her best corrected visual acuity was 6/6 in both eyes with normal anterior and posterior segment examination.



CASE 2:

24 years old, P2L2 , after spontaneous vaginal delivery had elevated BP on her 3rd postnatal period following which she complained of headache, blurring of vision, altered sensorium, inability to close eyes completely for 1 day. Her blood pressure was 170/ 100 mm Hg and started on injection Magnesium Sulphate and Injection Labetolol infusion.

On examination, her bedside vision could not be assessed as she was disoriented. Anterior segment examination was normal in both eyes. Fundus examination revealed Right eye : Splinter hemorrhage inferior to disc, edema around the disc less than 1 disc diopter in size not involving macula, Left eye : edema around the disc more than 2 disc diopter in size spreading toward macula . she was diagnosed as a case of serous retinal detachment in both eyes secondary to elevated BP. She was started on Flurbiprofen eye drops four times daily.

MRI Brain showed non-diffusion restricting T2 FLAIR hyperintensity noted involving bilateral posterior ganglio-capsular region, thalami, midbrain, pons, medulla, middle and inferior cerebellar peduncle and left cerebellar hemisphere. Features suggestive of atypical PRES.

Her blood investigations were as follows :

Test	Third post-natal day	Seventh post-natal day
Hemoglobin (g/dl)	15.3	14.8
Total Count (Cell/ cu.mm)	15,300	12,700
Platelets (Cells/u.mm)	1,30,000	42,000
Total Bilirubin (mg/dl)	NA	0.5
SGOT (unit/L)	NA	79
SGPT (unit/L)	NA	47
ALP (IU/L)	NA	103
Total Protein (g/dl)	NA	5.8

AT one week follow up visit, best corrected visual acuity was 6/6 in both eyes . Fundus examination showed Splinter hemorrhage inferior to disc in right eye, and normal retina in left eye. Best glasses were prescribed.

DISCUSSION:

PRES (Posterior Reversible Encephalopathy Syndrome) is usually completely reversible with early diagnosis and treatment of underlying cause. Whereas delay in appropriate treatment will lead to permanent brain damage. Elevated arterial blood pressure will be present in majority of patients. The PRES may develop following Pre-eclampsia, eclampsia, sepsis, Guillain Barre syndrome and chronic hypertension(3) The neuroimaging and clinical features are usually reversible. In MRI hyperintensity on T2 weighted (T2W)and Fluid attenuated inversion recovery (FLAIR)images in the parieto occipital and posterior frontal, cortical and subcortical white matter is most commonly involved in typical appearance of PRES. The cerebral edema observed predominantly in posterior region.

The complication of PRES are cerebral ischemia, intrace rebral hemorrhage, intracranial hypertension and status epilepticus. 40% of diagnosed PRES individuals require intensive care management and treatment.

PRES has been reported in all age groups frequently in young or middle aged adult with female sexual preponderance. Of the two leading theories of pathology of PRES, the first hypothesis proposes hypertensive crisis in majority of patients at PRES onset. According to this hypothesis elevated blood pressure leads to cerebral hypertension and subsequently vascular leakage and vasogenic edema. Reversible vasogenic edema was almost always present in the cortical or subcortical white matter of the parieto-occipital region, the exception being the uncommon central variant of brainstem and basal ganglia involvement, which has been noted in previous reports[4,5]. The increased cerebral perfusion pressure leads to blood brain barrier dysfunction resulting in extravasation of plasma and macro-molecules through tight junction proteins.

The arterial hypertension, the acute fluctuation of blood pressure for autonomic activity may induce changes in auto regulatory threshold leading to cerebral ischemia during hypertension or cerebral hyper-perfusion and vascular leakage during high blood pressure. The posterior area of cerebral hemisphere is susceptible, and it is supported by clinical and imaging findings. The theory of hypertensive episodes and cerebral hyper-perfusion in PRES, is still a

controversy.

The second theory regarding the cause of PRES is the circulating endogenous or exogenous toxins resulting in endothelial dysfunction as a triggering factor in this syndrome [6]. The presence of endogenic (Pre-eclampsia, sepsis) or exogenic (chemotherapy, immunosuppressive agents) , toxins causing endothelial dysfunction leading to vascular leakage and edema formation. The vasoconstrictive agents released by vascular endothelial cells resulting in cerebral vasospasm is frequently observed in PRES patients.

The toxic and immunogenic theory variation with excessive release of pro-inflammatory cytokines leading to endothelial activation with release of vasoactive agents resulting in increased vascular permeability and edema formation. This mechanism causing key feature to cause PRES in patients with autoimmune disorder and sepsis.

The PRES occurs frequently in Preeclampsia or Eclampsia individuals. Preeclampsia or eclampsia patients compli cating PRES may not show any significant difference in clinical and laboratorial data [7]. In comparison to pregnant women with isolated eclampsia or pre-eclampsia , significant elevation of hematocrit, serum creatinine, aspartate transaminase, alanine transaminase and lactate dehydro genase values were noted in pregnant women with PRES. In eclampsia, the acute kidney injury resulting from elevated blood pressure may precipitate PRES.

In its mild form, this disorder might cause only one clinical symptom (headache or seizure) and radiographically might show few areas of vasogenic oedema or even normal brain imaging in some rare cases. In severe forms, PRES might cause substantial morbidity and even mortality, most often as a result of acute haemorrhage or massive posterior fossa oedema causing obstructive hydrocephalus or brainstem compression[8].

PRES is characterized by variety of neurological symptoms developing within few hours up to several days or even weeks. The onset may be acute or subacute. The patients present with signs of encephalopathy, stupor, cognitive deficit, somnolence, or coma. A very common clinical feature is seizures - focal or generalized , observed in two third of the patients.

In three to thirteen percent of cases, seizures may result in status epilepticus and it is the most severe life threatening complication of PRES. In about 2/3rd of PRES individuals, ocular features in the form of deterioration in visual acuity, visual field defect including homonymous hemianopia and cortical blindness or visual hallucinations may be present . The neurological symptoms include headache, nausea, vomiting and disorders of consciousness.

MRI is the most appropriate diagnostic tool. Brain lesions are considered to be due to brain edema, which causes acute hypertension in pregnant women[9]. The presence of neurol ogical symptoms of acute onset with concurrent blood pressure fluctuation and vasogenic edema as neuroimaging findings and associated comorbidities or trigger factors are suggestive of PRES. CT scan shows vasogenic edema with bi-hemispheric distribution. MRI is most sensitive displaying hyperintense lesion in T2 weighted or fluid attenuated inversion recovery (FLAIR) sequences. This MRI lesion reflecting vasogenic edema frequently follows parieto-occipital pattern. This is usually bi-hemispheric but asymmetrical distribution of lesion may be present. Predo minantly subcortical areas with low density white matter and parietooccipital distribution in 70% patients .

In atypical PRES, apart from white matter changes in posterior parietal and occipital lobes of the brain, atypical location involves the brainstem, cerebellum and other cerebral areas (thalamus, basal ganglia and caudate nucleus [6,10]. Vascul opathic findings are usually reversible and includes cerebral vasoconstriction.

Diagnosis of atypical PRES poses a challenge to the physician since typical clinical manifestations may present with atypical imaging features . Patients may present with PRES even with our seizures.

CONCLUSION:

If PRES is identified and treated in early stage, rapid onset of symptoms and radiological features usually fully resolve within days to week. Long term use of anti convulsants may not be required in case of uncomplicated PRES. In case of status epilepticus, antiepileptic drugs, mechanical ventilation and corticosteroids along with anti hypertensive drugs, has to be started when malignant hypertension.

DECLARATION OF INTERESTS:

The authors declared no conflict of interest.

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