

## Case Discussion in Medicine

# A 19 year-old-primigravida with new onset headache and seizure at the third trimester

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### Section 1 :

19 year-old-primigravida, 38 weeks gestation presented with acute onset of headache of 2 days duration followed by four episodes of generalised tonic-clonic seizures of 1 day duration . On examination patient had elevated blood pressure 164/96 mmHg, pedal oedema, drowsy state and withdrawal movements of limbs to painful stimuli and no neck stiffness. She was immunized and had regular antenatal visit with no comorbidities.

#### Question for consideration :

(1) What are the differentials based on the history and examination ?

### Section 2 :

The patient was previously healthy and presented with new onset headache and seizure in third trimester of pregnancy and examination showed elevated blood pressure and altered sensorium. (a)Eclampsia would be the first differential (b) subarachnoid haemorrhage (c) cerebral venous sinus thrombosis. d) Ischemic stroke and haemorrhage . CVA was less likely as there was no focal deficit but cannot be ruled out without imaging. e) Central nervous system infection was least likely as there was no fever and neck stiffness.

#### Question for consideration :

(1) What is the next step?  
(2) What is the Antiepileptic drug choice and imaging choice in this patient?

### Section 3 :

Magnesium sulphate is the recommended drug for eclampsia. If seizure is not controlled by magnesium sulphate, antiepileptic drugs like fosphenytoin, levetiracetam and lacosamide can be added but other management of eclampsia should be addressed immediately which includes immediate termination of pregnancy by emergency C-section and blood pressure reduction. our patient received intravenous magnesium sulphate

#### Editor's Comment :

- Acute encephalopathy associated with hypertension, PRES should be one of the differentials.
- Accelerated hypertension, eclampsia, autoimmune diseases, renal failures and drugs are the known risk factors.
- CT Brain is the immediate investigation and MRI Brain with MRA and MRV is the ideal investigation for PRES.
- Parieto-occipital pattern (most common), holo-hemispheric watershed pattern, superior frontal sulcal pattern and central pattern are different radiological presentations of PRES.
- PRES carries good prognosis and management involves treatment of risk factors, blood pressure and antiepileptic drugs.

loading dose followed by maintenance dose for seizure and inj. labetalol for hypertension. Investigations revealed proteinuria further supporting eclampsia with normal blood parameters and electrolytes except low hemoglobin (10.5 gm/dl).

Though CT brain has radiation exposure to foetus, it is the first investigation done in neurological emergency. To minimize radiation exposure to foetus, it can be done with lead shield covering abdomen. Our patient didn't have infarct or haemorrhage in CT brain. She underwent emergency C-section in view of eclampsia. Post C-section patient didn't have any seizure and magnesium sulphate was continued along with antihypertensive.

#### Question for consideration :

(1) Is MRI brain necessary in this patient?

### Section 4 :

Though CT brain is the first investigation, it is not ideal investigation for neurological emergency. MRI brain with MRA and

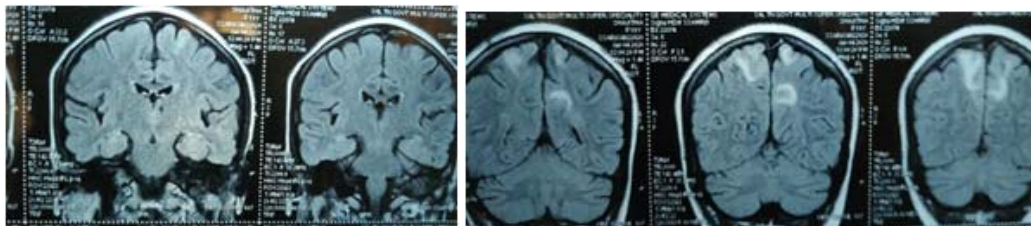


Fig 1 — MRI brain FLAIR sequence shows white matter hyperintensity in parieto-occipital region s/o PRES

MRV should be done to rule out cerebral venous sinus thrombosis in this case which can be easily missed in plain CT brain. Our patient underwent MRI brain on day 2 post C-section which revealed bilateral T2/FLAIR hyperintensity in white matter of parieto-occipital region suggestive of Posterior Reversible Encephalopathy Syndrome (PRES) (Fig 1). Patient sensorium improved with supportive treatment and oral labetalol was continued with blood pressure monitoring. She was discharged in full conscious state with no focal deficit on day 12 post LSCS and labetalol was stopped during follow up.

#### Question for consideration :

- (1) What is posterior reversible encephalopathy syndrome (PRES)?
- (2) What is the association between PRES and Eclampsia?
- (3) What are the radiological features of PRES?
- (4) How do you treat it?
- (5) What is the prognosis and complications of PRES?

#### Section 5 :

Posterior reversible encephalopathy syndrome (PRES) is a clinical-radiological syndrome characterised by reversible acute neurological symptoms like headache, blurred vision, seizure and altered sensorium associated with an imaging evidence of vasogenic oedema in the white matter of brain predominantly in parieto-occipital region<sup>1</sup>. It occurs as a result of failure of cerebral blood pressure autoregulation when blood pressure is elevated suddenly leading to hyperperfusion and vasogenic oedema and other mechanisms include toxic or immune mediated damages to endothelial cells of brain capillaries leading to white matter oedema. Accelerated hypertension, eclampsia, renal failure, autoimmune diseases (Systemic lupus erythematosus, polyarteritis nodosa) and drugs (cyclosporin A, bevacizumab, cisplatin, methotrexate, biological agents) are the known risk factors associated with PRES which mediate above pathogenesis<sup>2</sup>. Though it is a neurological condition, it is often encountered in other specialities like obstetrician, nephrologist, rheumatologist and medical oncologist due to these associated risk factors.

In pregnant woman, PRES is commonly seen in association with preeclampsia/eclampsia. Among 104 eclampsia patients, 74(71%) eclampsia patients had radiology features of Posterior reversible encephalopathy syndrome in a large prospective Indian cohort study<sup>3</sup>. It usually occurs at the third semester and puerperium. Headache and seizure in peripartum period should include PRES as one of the differential diagnosis apart from eclampsia, cerebral venous thrombosis, vascular insult and meningoencephalitis.

Four patterns have been described in MRI based on the region involved (1) Parieto-occipital (most common), (2) Holo-hemispheric watershed pattern, (3) Superior frontal sulcus pattern and (4) Central

pattern involving deep white matter, basal ganglia and brainstem<sup>4</sup>. Our patient had most common parieto-occipital pattern. Normally anterior circulation is adequately supplied by adrenergic sympathetic fibres compared to posterior circulation which has inherent deficiency of adrenergic control making it more susceptible for hyperperfusion injury and vasogenic oedema in posterior region of brain. Top of basilar stroke causing bilateral posterior cerebral infarction should be differentiated from PRES as both causes bilateral posterior lesion but latter usually spares calcarine and paramedian parts of occipital lobe.

Management of PRES involves treatment of risk factors, antihypertensives, stopping offending drugs and antiepileptics. Our patient received magnesium sulphate for seizure and pregnancy was terminated immediately with C-section as a management of eclampsia and blood pressure was controlled with inj. labetalol. Blood pressure control is very important in PRES management as inadequate control and delay are associated with an increased morbidity and mortality. Blood pressure needs to be gradually reduced except in malignant hypertension as more aggressive reduction leads to cerebral ischemia and clinical worsening. The general recommendation is to reduce 10-25% of mean arterial blood pressure over a 24-hour period except in malignant hypertension where 25% of blood pressure reduction is recommended in first 6 hours. Nicardipine, labetalol, clevidipine are short acting, rapidly reversible, the titratable safe intravenous antihypertensive drugs for hypertensive emergencies.

PRES is a reversible condition and 75 to 90% recover fully. Irreversible neurological injury and permanent deficits are seen in around 10-20% cases where MRI brain reveals associated complications like infarction or haemorrhage. Our patient recovered fully with out neurological deficit and MRI brain also didn't reveal any infarction or haemorrhage.

#### REFERENCES

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