Acta Scientific MEDICAL SCIENCES (ISSN: 2582-0931)

Volume 7 Issue 8 August 2023

Case Report

Posterior Reversible Encephalopathy Syndrome (PRES) in a Normotensive Pregnant Patient into Labour: A Case Report

Sofia Tsiapakidou[1]*, Eleftherios Klonos[1], Stella Chondromatidou[2], Grigoris F Grimbizis[1] and Theodoros D Theodoridis[1]

[1] Professor, 1st Department of Obstetrics and Gynecology, Medical School, Aristotle University of Thessaloniki, Thessaloniki, Greece

[2]Department of Radiology, Papageorgiou General Hospital, Ring Road-Nea Efkarpia, Thessaloniki, Greece

***Corresponding Author:** Sofia Tsiapakidou, Professor, 1st Department of Obstetrics and Gynecology, Medical School, Aristotle University of Thessaloniki, Thessaloniki, Greece.

DOI: 10.31080/ASMS.2023.07.1643

Received: December 08, 2022

Published: July 25, 2023

Abstract

Objective: To present a case of posterior reversible encephalopathy syndrome (PRES), a rare neurological disorder that can be presented, in association with preeclampsia, during pregnancy.

Case Report: This is the case of a 31-year-old nullipara at 40 weeks of pregnancy who presented with a sudden loss of consciousness accompanied by convulsions. She was normotensive throughout her pregnancy. An acute intracranial pathology, such as venous thrombosis, stroke, and cerebral hemorrhage was suspected. Neuroimaging revealed a parieto-occipital pattern reflecting vasogenic oedema and in correlation with postpartum seizures, PRES was diagnosed.

Conclusion: There is heterogeneity in how PRES can be presented, especially in the obstetric population, however, we emphasize the importance of early recognition and appropriate management in the obstetric population.

Keywords: Encephalopathy; Labour; Posterior Reversible Encephalopathy Syndrome; Pregnancy; PRES

Abbreviations

PRES: Posterior Reversible Encephalopathy Syndrome; CT: Computer Tomography; ICU: Intensive Care Unit; MRI: Magnetic Resonance Imaging

Introduction

During pregnancy, hypertensive disorders affect around 8% to 10% of all pregnant women and can be associated with substantial complications for the woman and the baby. Pre-eclampsia is referred to as the new onset of hypertension occurring in the second half of pregnancy with multi-organ involvement features; when it presents with seizures, it is called eclampsia. Hypertension in pregnancy is the cause of significant maternal morbidity, perinatal morbidity, and stillbirth. Women with hypertension during pregnancy are also at increased risk of presenting a cardiovascular disease later in life. Pre-eclampsia can develop during pregnancy, during delivery, and postpartum as its complications [1].

Posterior reversible encephalopathy syndrome (PRES) is a rare but severe complication seen in pre-eclampsia and eclampsia. Its diagnosis derives from a combination of clinical and imaging features characterized by headache, visual impairment, altered mental state, generalized tonic-clonic, self-limiting, and short duration [2]. Imaging reveals cerebral oedema, which mostly affects

the parietal and occipital lobes. Its pathogenesis is unknown, as its correlation to pre-eclampsia and eclampsia in pregnancy. There are two proposed pathophysiological mechanisms for PRES, the vasogenic, and the vasospasm theory [3]. According to the vasogenic theory, a rapid rise in blood pressure combined with autoregulatory failure results in dilatation of cerebral arterioles, and brain hyperperfusion, causing vasogenic cerebral oedema. The vasospasm theory associates severe vasospasm due to the sudden rise in blood pressure, and the cerebral vessels' reaction results in hypoperfusion of the brain parenchyma. The provoked ischemia leads to cytotoxic oedema with or without actual cerebral infarction and further endothelial cell damage. In eclampsia, cerebral oedema and the presence of multiple petechial cerebral parenchymal hemorrhages are typical pathological findings. PRES patient's brain biopsy showed extensive oedematous white substance abnormalities without definite evidence of vessel wall damage or infarction [3].

Imaging such as computer tomography (CT) and magnetic resonance imaging (MRI) of the central nervous system after a severe manifestation of pre-eclampsia or eclampsia can reveal PRES complications. This condition has been characterized as a type of hypertensive encephalopathy. MRI is the gold standard for the diagnosis of PRES syndrome. Typical findings are symmetric oedema involving the white matter of the posterior regions of the cerebral hemispheres, mostly of the occipital lobes, posterior parietal lobes, and posterior temporal lobes [4,5].

Hypertensive disorders, especially pre-eclampsia, should be considered in women with a headache or altered mental status during pregnancy, labor, or postpartum. Early clinical suspicion and diagnosis are essential to managing disease progression and different prognoses in PRES and pre-eclampsia.

We present a case with intrapartum PRES that evolved in an atypical and rapid way, which strengthens the need for high clinical suspicion and further intervention.

Case Presentation

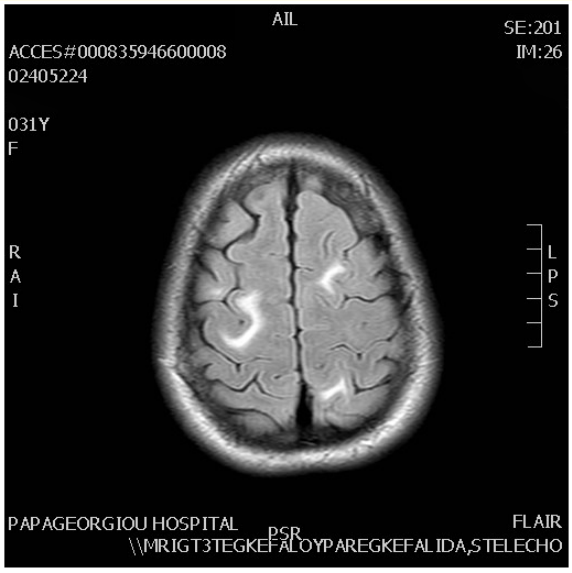
A 31-year-old nullipara patient was referred to our department at 40+0 weeks of pregnancy due to the sudden onset of a confusing episode with accompanying loss of consciousness, convulsions, and turning head to the right side. She was initially evaluated by a specialist neurologist as she was stimulating, and therefore she was given diazepam 3mg and propofol 50mg as a stat dose. The neurologist put the differential diagnosis of an acute intracranial pathology, such as venous thrombosis, stroke, and cerebral hemorrhage, and recommended an immediate referral to a tertiary hospital.

On arrival at our unit, the patient was unresponsive due to drug sedation and had another convulsions episode. Its duration was > 1 minute, and the blood pressure was 120/80mmHg with a heart rate of 100bpm. Pregnancy history and accompanying medical notes indicated an uncomplicated pregnancy, with regular screenings and with only vitamin supplements.

As intracranial pathology was suspected, an uncomplicated emergency caesarean section was performed. The patient remained normotensive during the procedure, a CT performed after the delivery revealed a possible presence of venous angioma in the parietal lobe and the absence of hemorrhagic material.

One hour after the delivery, the patient had an episode of generalized tonic-clonic seizures, which were, for the first time, accompanied by high blood pressure (170/100mmHg). She received a loading dose of 4g of Magnesium sulfate intravenously (iv) followed by a maintenance infusion of 1 to 2 g/h by a controlled infusion pump. She was transferred to the Intensive Care Unit (ICU) to be under close monitoring. An immediate neurological assessment was performed after her arrival at ICU, as she complained of blurred vision. Normal ocular movement and without motor or sensory deficits were found. Brain MRI revealed a pathological signal of the subcortical white matter of the posterior parietals and less of the occiput lobe concomitant signal enrichment. No signal enrichment was observed in the diffusion sequences. In combination with the patient's history, MRI findings of angiogenic oedema put the diagnosis of PRES. Figure 1 and figure 2.

During her hospitalization, the patient remained calm, responsive, hemodynamically stable, fever-free, and without any other episodes of seizures. She was discharged from the ICU with antihypertensive treatment recommendations (terazosin



Figures 1: Magnetic resonance imaging with T2-flair-weighted images showing the typically hyperintense bilateral lesions in the subcortical white matter of the posterior parietal lobes.

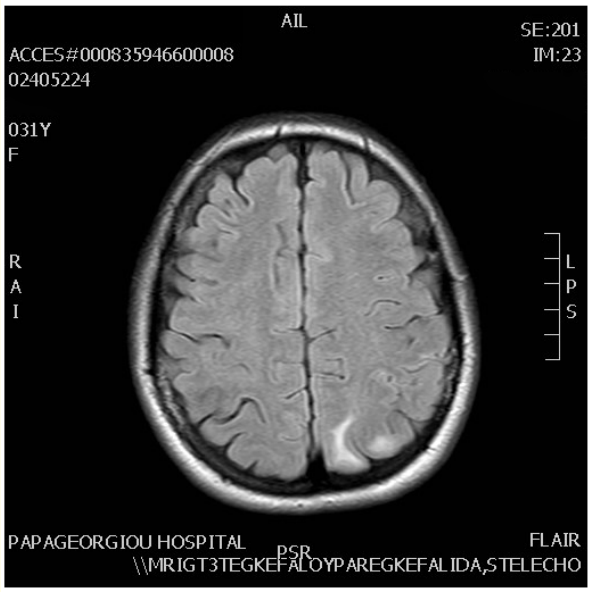


Figure 2: Magnetic resonance imaging with T2-flair-weighted images showing lesser hyperintense lesions in the occipital lobes indicating the presence of vasogenic oedema.

2mg twice daily po if the systolic BP is ≥130mmHg metoprolol 25mg twice daily po if heart rate ≥60/min), antiepileptic therapy (levetiracetam 1.5gr twice daily iv), low-molecular-weight heparin and adviced serum glucose monitoring.

She was discharged from the hospital four days later, with recommendations for continuous antihypertensive and antiepileptic treatment (felodipine 5mg twice daily po, metoprolol 25mg twice daily po, and levetiracetam 1500mg twice daily po, respectively. Within 4 weeks she was assessed by a cardiologist and neurologist. Both the new MRI and electroencephalogram were unremarkable whilst her blood pressure was within normal limits, and she was free of symptoms.

Six months after her delivery antiepileptic treatment was omitted. Ever since she remains asymptomatic, without any episode of high blood pressure, nor the need for antiepileptic or antihypertensive medication.

Results and Discussion

Pre-eclampsia is the onset of hypertension (over 140mmHg systolic or over 90mmHg diastolic) after 20 weeks of pregnancy and the coexistence of 1 or more of proteinuria, renal impairment, elevated transaminases with or without right upper quadrant or epigastric abdominal pain, neurological symptoms as blurred vision, altered mental status, seizures, thrombocytopenia, hemolysis, and others. It may be life-threatening if it is not early suspected to be treated properly [1].

Magnesium sulfate has been widely used for the prevention and treatment of seizures in pre-eclampsia and eclampsia, as well as a tocolytic agent. Its benefit as neuroprotection in preterm babies has also been discussed [6].

PRES is a clinical and radiological condition and can be seen in various cases. During immunosuppressant drug treatment, infection, autoimmune diseases break, and chemotherapy is the most common medical condition [7]. Pathogenesis of PRES is unknown and thought to be multifactorial, with similarities with pre-eclampsia [8]. A study suggests MRI scans for all asymptomatic patients during the third trimester with severe pregnancy-induced hypertension, and if there are abnormal cerebral findings, such as oedema, an immediate delivery should be considered to prevent

the development of eclampsia [11]. MRI imaging frequently shows a distinctive bilateral parieto-occipital distribution of changes suggesting vasogenic oedema. The combination with the clinical symptoms can help clinicians with a quick diagnosis and further prompt management. Due to its rare appearance, there are no evidence-based diagnostic algorithms or published recommendations for treatment. The treatment is symptomatic, and its overall prognosis is favorable, as its symptoms are reversible in most patients. However, a neurological follow-up and reevaluation are needed as long-term epilepsy even after six months of the first episode may persist in individual cases [10,11].

To our knowledge, this is the first case report of intrapartum PRES without previous hypertension in pregnancy who presented with sudden altered mental status followed by seizures.

Conclusion

Physicians should be aware of this rare condition which is unpredictable and immediate diagnosis and management are of great importance for the outcome. PRES is an uncommon neurological disorder with acute-onset symptoms, and obstetricians should be aware of its association with pre-eclampsia.

Conflict of Interest

The authors declare no conflict of interest for this article.

Bibliography

1. Webster Katie., *et al*. "Diagnosis and management of hypertension in pregnancy: summary of updated NICE guidance". *BMJ (Clinical Research ed.)* 366 (2019): l5119.

2. Parasher Anant and Rajat Jhamb. "Posterior reversible encephalopathy syndrome (PRES): presentation, diagnosis and treatment". *Postgraduate Medical Journal* 96.1140 (2020): 623-628.

3. Fugate Jennifer E and Alejandro A Rabinstein. "Posterior reversible encephalopathy syndrome: clinical and radiological manifestations, pathophysiology, and outstanding questions". *The Lancet Neurology* 14.9 (2015): 914-925.

4. Bartynski, W S. "Posterior reversible encephalopathy syndrome, part 1: fundamental imaging and clinical features". *AJNR. American Journal of Neuroradiology* 29.6 (2008): 1036-1042.

5. Bartynski WS. "Posterior reversible encephalopathy syndrome, part 2: controversies surrounding pathophysiology of vasogenic edema". *AJNR. American Journal of Neuroradiology* 29.6 (2008): 1043-1049.

6. Amaral Lorena M., *et al*. "Pathophysiology and Current Clinical Management of Preeclampsia". *Current Hypertension Reports* 19.8 (2017): 61.

7. Pedraza Rodrigo., *et al*. "Posterior reversible encephalopathy syndrome: a review". *Critical Care Shock* 12.4 (2009): 135-143.

8. Nielsen Lise Hald., *et al*. "Posterior reversible encephalopathy syndrome postpartum". *Clinical Case Reports* 3.4 (2015): 266-270.

9. Ekawa Yuka., *et al*. "Reversible posterior leukoencephalopathy syndrome accompanying eclampsia: correct diagnosis using preoperative MRI". *The Tohoku Journal of Experimental Medicine* 226.1 (2012): 55-58.

10. Fischer Marlene and Erich Schmutzhard. "Posterior reversible encephalopathy syndrome". *Journal of Neurology* 264.8 (2017): 1608-1616.

11. Postma Ineke R., *et al*. "Long-term consequences of the posterior reversible encephalopathy syndrome in eclampsia and preeclampsia: a review of the obstetric and nonobstetric literature". *Obstetrical and Gynecological Survey* 69.5 (2014): 287-300.