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POSTERIOR REVERSIBLE ENCEPHALOPATHY SYNDROME ASSOCIATED WITH ECLAMPSIA AND INTRAUTERINE FETAL DEMISE: A CASE REPORT AND LITERATURE REVIEW

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ABSTRACT

Posterior reversible encephalopathy syndrome (PRES) is a rare clinico-radiological syndrome that may occur in the setting of hypertensive disorders of pregnancy, particularly severe preeclampsia and eclampsia. It is characterized by acute neurological manifestations such as seizures, headache, visual disturbances, confusion, and characteristic neuroimaging abnormalities related mainly to vasogenic cerebral edema. We report the case of a 17-year-old primigravida with an unsupervised pregnancy estimated at 33 weeks of gestation, admitted to the obstetric emergency department for an eclamptic seizure. Obstetric ultrasound confirmed intrauterine fetal demise. Laboratory investigations showed significant proteinuria, thrombocytopenia, elevated liver enzymes, increased lactate dehydrogenase, and mild renal impairment, consistent with severe preeclampsia. Vaginal delivery resulted in the birth of a male fetus weighing 1655 g. Cerebral computed tomography performed after obstetric management revealed findings suggestive of PRES. The patient received multidisciplinary management with close monitoring, blood pressure control, and anticonvulsant therapy, followed by complete neurological recovery without residual deficits. This case highlights the importance of considering PRES in pregnant patients presenting with seizures or other neurological symptoms in the context of preeclampsia or eclampsia.

KEYWORDS: Eclampsia; intrauterine fetal demise; neuroimaging; posterior reversible encephalopathy syndrome; pregnancy; severe preeclampsia.

INTRODUCTION

Posterior reversible encephalopathy syndrome (PRES) is a clinico-radiological entity characterized by acute or subacute neurological symptoms associated with typical neuroimaging findings, most often reflecting vasogenic edema involving the posterior cerebral regions.[1] The syndrome was initially described as reversible posterior leukoencephalopathy, but the term PRES is now widely used because cortical involvement, atypical locations, and incomplete reversibility may occur.[3]

The clinical presentation is variable and may include headache, seizures, altered mental status, visual disturbances, nausea, vomiting, and focal neurological deficits.[1,5] PRES is associated with several conditions, including severe hypertension, renal disease, autoimmune disorders, sepsis, immunosuppressive therapy, and hypertensive disorders of pregnancy.[1,4,5] In obstetrics, severe preeclampsia and eclampsia are among the most important triggers, and PRES is increasingly recognized as a neurological manifestation of endothelial dysfunction related to these disorders.[2]

Early diagnosis is essential because PRES is potentially reversible when the underlying cause is promptly treated. However, delayed recognition may lead to cerebral infarction, intracranial hemorrhage, persistent epilepsy, or permanent neurological impairment.[1,5,6] We report a case of PRES associated with eclampsia and intrauterine fetal demise in a 17-year-old primigravida, with favorable maternal outcome after multidisciplinary management.

CASE PRESENTATION

A 17-year-old primigravida with no known medical history was admitted to the obstetric emergency department following an eclamptic seizure. The pregnancy was not medically supervised and was

estimated at 33 weeks of gestation. On admission, her blood pressure was 160/90 mmHg, heart rate was 98 beats per minute, and temperature was 37°C. Fetal heart sounds were absent on initial evaluation.

Obstetric examination revealed a cervix dilated to one finger and 60% effaced, with a cephalic presentation and intact membranes. Obstetric ultrasound demonstrated a singleton intrauterine pregnancy with absent fetal cardiac activity, confirming intrauterine fetal demise.

Laboratory investigations revealed significant proteinuria (+++), thrombocytopenia at 100,000/mm³, elevated liver enzymes approximately twice the upper limit of normal, increased lactate dehydrogenase levels, serum creatinine of 10 mg/L, and hemoglobin of 11 g/dL. Coagulation tests, including prothrombin time and activated partial thromboplastin time, were normal. Serum sodium and potassium levels were within normal ranges. These findings were consistent with severe preeclampsia complicated by eclampsia.

The patient underwent vaginal delivery, resulting in the birth of a male fetus weighing 1655 g. After delivery, she was transferred to the intensive care unit for further monitoring and neurological evaluation. Cerebral computed tomography demonstrated findings suggestive of posterior reversible encephalopathy syndrome. Multidisciplinary management was initiated, including close maternal monitoring, blood pressure control, and anticonvulsant therapy. The clinical course was favorable, with progressive neurological improvement and complete recovery without residual neurological deficits at discharge.

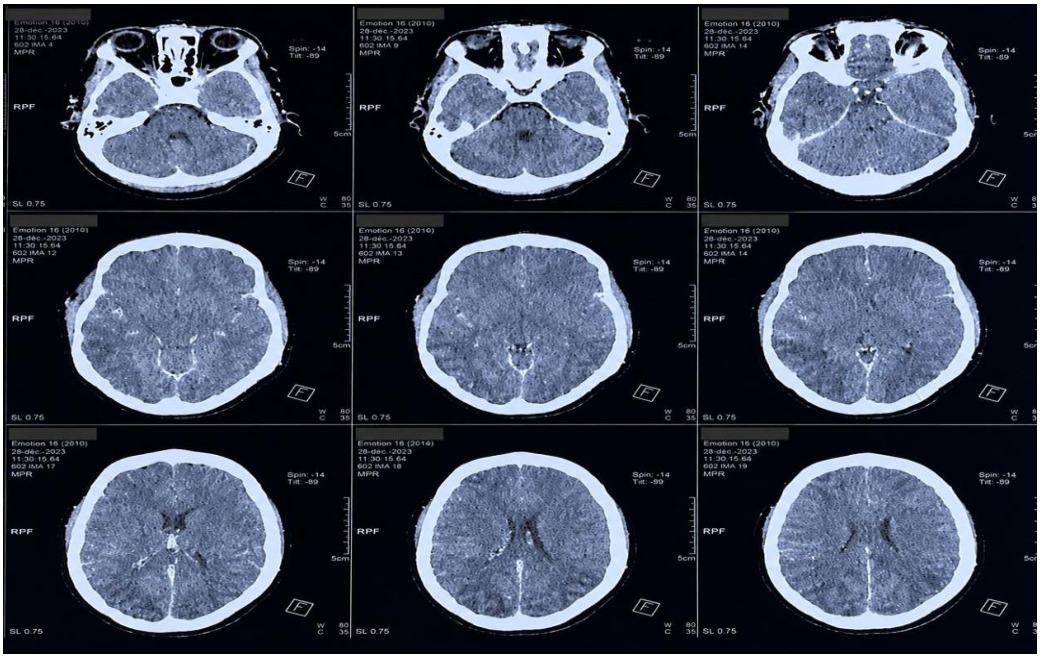

Figure 1 : Axial brain computed tomography showing bilateral parieto-occipital hypodense areas suggestive of vasogenic edema, consistent with PRES in the context of eclampsia.

DISCUSSION

PRES is a rare but important neurological complication that should be recognized early in obstetric practice. It is characterized by vasogenic edema, most commonly affecting the parieto-occipital regions, although frontal, temporal, cerebellar, basal ganglia, brainstem, and deep white matter involvement may also occur.[1,4,5] The term "posterior" therefore does not exclude atypical lesion distribution, and the term "reversible" should not lead clinicians to underestimate the potential severity of the syndrome.

The pathophysiology of PRES remains incompletely understood. Two main mechanisms are commonly discussed. The first involves severe acute hypertension exceeding cerebral autoregulatory capacity, resulting in hyperperfusion, blood-brain barrier disruption, and vasogenic edema. The second emphasizes endothelial dysfunction, vasoconstriction, hypoperfusion, and increased vascular permeability.[1,5] In preeclampsia and eclampsia, systemic endothelial dysfunction, inflammation, and abnormal vascular reactivity are central features, which may explain the strong association between these obstetric conditions and PRES.[2,6]

Our patient presented with several markers of severe preeclampsia, including significant proteinuria, thrombocytopenia, elevated liver enzymes, increased LDH, and mild renal impairment. These biological abnormalities reflect systemic endothelial injury and multiorgan involvement. The presence of eclampsia, fetal demise, and PRES in the same patient illustrates the severity of maternal vascular dysfunction and the need for rapid multidisciplinary management.

Neurological manifestations of PRES are often nonspecific. Seizures are among the most frequent presenting symptoms and may be generalized or focal. Headache, confusion, visual impairment, cortical blindness, altered consciousness, and focal neurological deficits may also occur.[1,5] In pregnant women, these symptoms may be initially attributed to eclampsia alone. However, neuroimaging is important when symptoms are severe, atypical, persistent, or associated with altered consciousness, because it helps confirm PRES and exclude differential diagnoses such as intracranial hemorrhage, cerebral venous thrombosis, ischemic stroke, and central nervous system infection.

Magnetic resonance imaging is considered the gold standard for the diagnosis of PRES because it is more sensitive than computed tomography in detecting vasogenic edema, particularly on T2-weighted and fluid-attenuated inversion recovery sequences.[1,4,5] Diffusion-weighted imaging is useful to distinguish reversible vasogenic edema from cytotoxic edema and infarction. Nevertheless, computed tomography is often the first-line examination in emergency settings because of its availability and speed. Although CT may be normal in some cases, it can show hypodense lesions in posterior cerebral regions and may be sufficient to suggest the diagnosis when interpreted in the appropriate clinical context.[4]

Management of PRES is based on prompt treatment of the underlying cause. In obstetric cases, this includes management of severe preeclampsia or eclampsia, seizure control, blood pressure control, correction of metabolic disorders, and close neurological and obstetric monitoring. Delivery is a key component of management when PRES occurs in the context of severe preeclampsia or eclampsia during pregnancy. Anticonvulsant therapy, particularly magnesium sulfate in eclampsia, is essential for seizure prevention and treatment, while antihypertensive therapy should be used carefully to avoid excessively rapid reduction in blood pressure.[1,2,6]

The prognosis of PRES is generally favorable when diagnosis and treatment are timely. Clinical improvement often occurs within days, and radiological abnormalities may resolve over days to weeks. However, PRES is not always benign. Severe cases may be complicated by intracranial hemorrhage, ischemia, brain herniation, persistent seizures, or death.[1,5] In the present case, despite the severe obstetric presentation and intrauterine fetal demise, the maternal outcome was favorable, with complete neurological recovery. This outcome supports the importance of early recognition, urgent stabilization, and coordinated management between obstetricians, intensivists, neurologists, and radiologists.

CONCLUSION

PRES should be considered in pregnant women presenting with seizures or acute neurological symptoms in the setting of severe preeclampsia or eclampsia. Although magnetic resonance imaging remains the reference imaging modality, computed tomography may provide important diagnostic clues in emergency settings. Early recognition, blood pressure control, anticonvulsant therapy, obstetric management, and multidisciplinary care are essential to prevent irreversible neurological complications and improve maternal outcomes.

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