

## Case Report

# Posterior Reversible Encephalopathy Syndrome during Pregnancy: A Case Report

Maasoumeh Mirzamoradi<sup>1</sup>, Nayyereh Rahmati<sup>2\*</sup>, Ayda Khandani<sup>3</sup>, Nahid Rezaei Aliabad<sup>3</sup>, Yekta Parsa<sup>3</sup>

<sup>1</sup> Department of Perinatology, Mahdijeh Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>2</sup> Department of Gynecology and Obstetrics, Mahdijeh Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>3</sup> Mahdijeh Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

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## Abstract

**Background:** Posterior reversible encephalopathy syndrome (PRES) is a neurological condition entity presenting with headache, confusion, seizure, altered mentation and loss of vision associated with white matter changes on imaging. The lesions in PRES are thought to be due to vasogenic edema, mainly in the posterior cerebral hemispheres.

**Cases Report:** This study has reported a patient who developed PRES without any indicators for preeclampsia-eclampsia in her pregnancy. The patient's brain images showed abnormal signal intensity in the occipital lobe.

**Conclusion:** Posterior reversible encephalopathy syndrome is reversible when initial diagnosis established and suitable treatment start immediately.

**Keywords:** Posterior reversible encephalopathy syndrome, Eclampsia, Pregnancy, Preeclampsia

**\*Corresponding Author:** Nayyereh.Rahmati, M.D. Department of Gynecology and Obstetrics, Mahdijeh Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran. Tel: +989124430179. Email: n136054@yahoo.com

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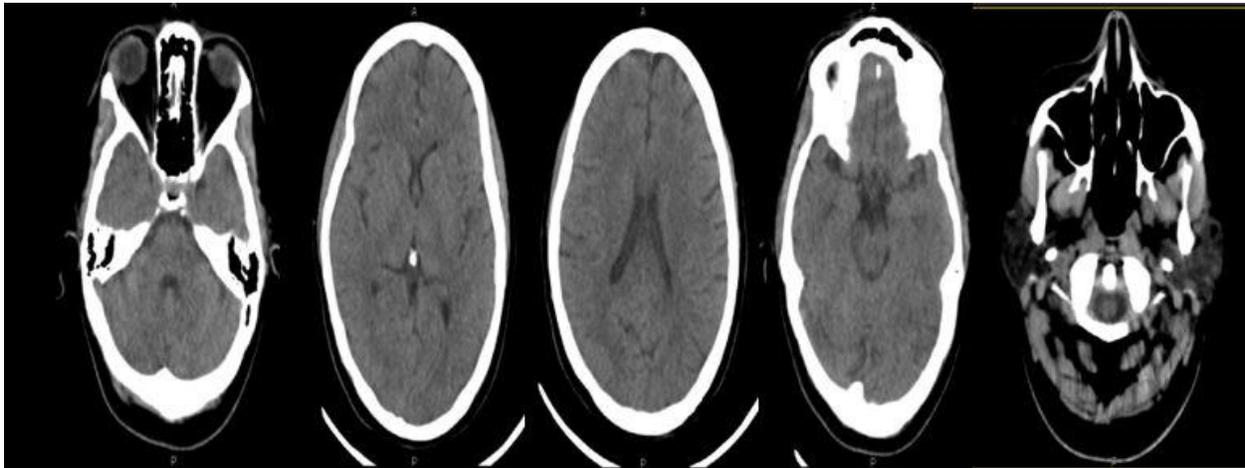
## Introduction

Posterior reversible encephalopathy syndrome (PRES) is a clinical and radiological syndrome characterized by a variety of symptoms, including headache, nausea, vomiting, seizures, visual abnormalities and altered mental status, focal neurologic deficits, stupor and coma<sup>1</sup>. This syndrome is also known as reversible posterior cerebral edema syndrome, hyperperfusion encephalopathy, or brain capillary leak syndrome<sup>2</sup>. PRES accompany by a variety of predisposing conditions, including acute hypertension, hypertensive encephalopathy, preeclampsia or eclampsia, renal disease, sepsis, blood transfusion, autoimmune disease, and use of cytotoxic and immunosuppressant drugs<sup>3</sup>.

Preeclampsia and eclampsia are the most common causes of PRES. Prompt recognition and treatment is crucial to avoid the permanent damage leading to sequelae and even mortality. Therefore, a high level of suspicion is necessary to recognise and prevent the long-term sequelae of reversible conditions like PRES. In this case report, we presented a case of PRES, which occurred in an early postpartum woman with the tendency toward preeclampsia.

## Case Report

A 28-year-old pregnant woman, a twin pregnancy (DD), as the result of IVF with a gestational age of 37+5 for pregnancy care referred to a high-risk health center and due to term pregnancy and the onset of labor pain,



**Figure 1. Brain CT Scan.**

she candidated for the termination of pregnancy. She had no visual abnormalities and her blood pressure was 120/80 mmHg with pulse rate of 88/minute. Patient's PNC documents were as follows:

- Normal blood pressure during pregnancy care
- Normal blood sugar chart (treated with insulin)
- There was no excess weight gain and no edema
- 28 weeks: GTT (FBS: 100, 1 h: 157, 2 h: 142, 3 h: 121)
- Urine during 24 hours (29 weeks: creatinine 892, volume 1750, proteins 126)

She was treated with a cesarean section. Her blood pressure during the operation was 100-120/70-85 mmHg with pulse rate of 80-90/minute. During the operation after placental expulsion we noticed the uterine atony. Sentosinone and Methergine 0.2 mg were prescribed because the persistent firm uterus misoprostol 800 mcg was prescribed. Before transferring the patient to the recovery section, she was checked for consistency and bleeding of the uterus, and we noticed the uterine atony and vaginal bleeding again more than normal level. The attending physician was informed. Two vessels were immediately taken for the patient. Ringer's solution and Sentosinone were prescribed. The two-hand massage was given. Blood test were performed. Coagulation and cross-match test panel were sent. Oxygen was used. The patient was kept warm and intramuscular F2@ was prescribed for the patient. After the injection of prostaglandin, the patient suffered from chills, vomiting, and headache and due

to this condition Pethidine was injected. The patient's blood pressure was checked and her pressure increased up to 210/120, and the patient had a severe headache, blurred vision, but was alert and answered the questions. Due to the blood pressure rise 20 mg of lebutalol was prescribed to the patient, the cardiologist was informed who stated that due to the patient's record brain CT scan has to be done. Ten minutes later, the blood pressure was rechecked and it was 180/110, that 40 mg of Labetalol was prescribed. Due to severe blood pressure and blurred vision, headache and vomiting, pre-eclampsia has diagnosed susceptibly, and serum sulfate was prepared for the patient. At the same time, she suffered upward Gaze and the GTC seizure and the anesthesiologist intubated her. The internal specialist was informed and indicated that the pupils were Mydriasis and did not respond to the light and they have Papilledema. We believed that there was the possibility of a hemorrhagic shock and brain injury was given in the field of hypoxia, and bedside sonography was performed that did not have ascites. In addition, there was the possibility of brain bleeding and in order to, the patient transfer to imaging center for doing CT scan. Then, the patient was visited by a neurologist. According to the attendant neurologist, the patient's CT scan did not have any acute pathological lesions and does not require anti-epileptic receiving (Figure1)

Blood pressure monitored and the patient received sulfate and discharged from the neurological service. The patient was transferred to ICU and her blood

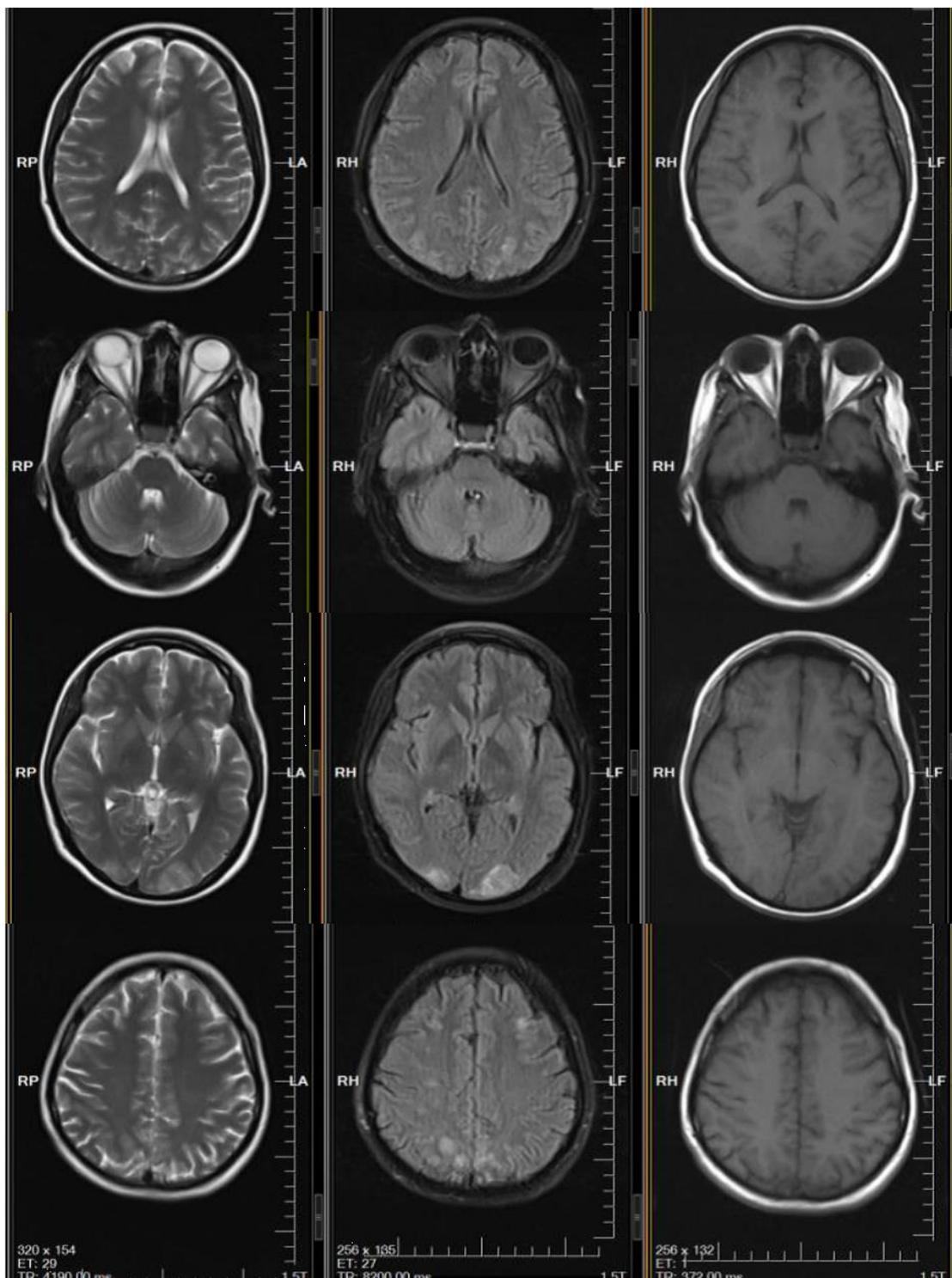


Figure 2. Brain MRI.

pressure was 151/100 mmHg with pulse rate of 102/minute. After 2 hours, the patient was ex-tubated and she was alert and oriented. She did not have a headache and still complained about blurred vision.

Due to the persistence of blurred vision, she was sent to perform MRI (Figure 2), and according to neurology consultation, she was accepted with the diagnosis of PRES. The patient was admitted to ICU. The surgical

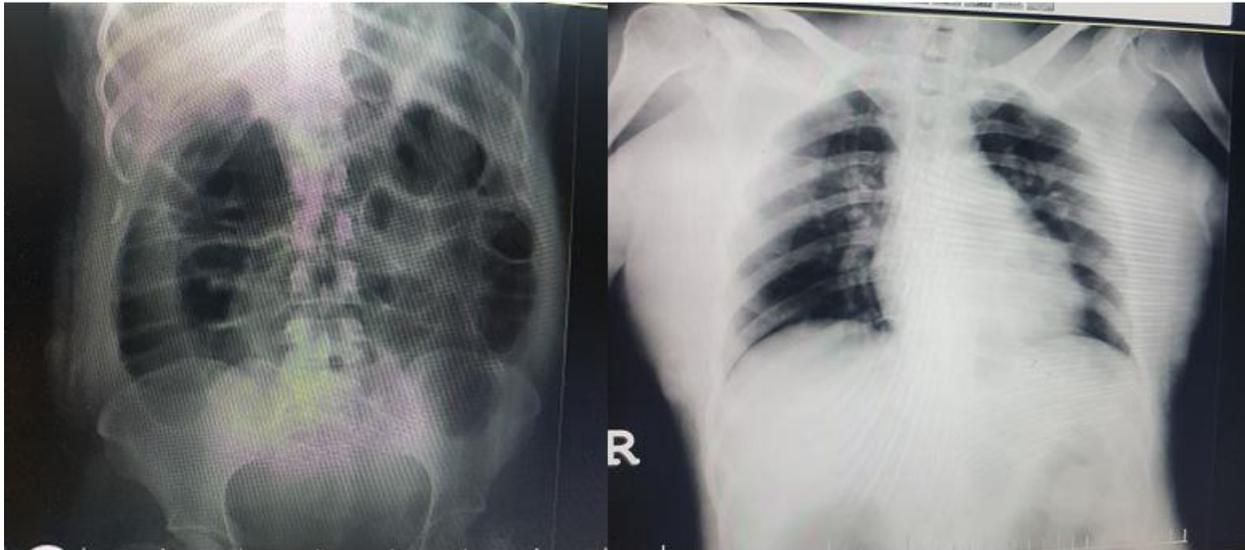


Figure 3. Supine and upright plain abdominal radiographs.

consultation was done due to abdomen distention and supine and upright plain abdominal radiographs (Figure 3) were done for patient then with the diagnosis of ileus, colonoscopy of decompression, and NG tube and rectal tube were done for the patient. Because rectal tube was not needed, it was removed, and neostigmine was prescribed for the patient after it has been prescribed. there were bowel movements, and distension was reduced. The patient was visited by neurology service and levebel 500 BD was used for the patient. Then, patient was discharged from hospital with a well general condition.

## Discussion

Posterior reversible encephalopathy syndrome is the brain vasogenic edema within the framework of systemic toxicity. This syndrome accompany by neuroradiological changes associated with several clinical features. The theory that PRES related to changes in vessel self-regulation caused by a severe blood pressure increase in pregnancy shows that hypertensive preeclampsia is the pathophysiological mechanism underlying PRES. However, this case was a normotensive patient with preeclampsia and showed that PRES could be triggered by pathophysiological mechanisms that could overlap preeclampsia<sup>4</sup>.

During pregnancy, the cardiovascular system adapts to the increased metabolic necessities through composite hormonal and hemodynamic changes. High

levels of estroprogestin lead to an increase of renin activity, which leads to a progressive increase of plasmatic volume. Notwithstanding the fact that this state related to an increase of the hematic corpuscular volume, it leads to hemodilution-related anemia. The heart activity compensates for fetal metabolic requirements and hypervolemia with an increase of efficiency and frequency, ranging from 30% to 50%. Furthermore, due to prostacyclin increase and circle redistribution within low resistance and high flow districts, a fall in peripheral vascular resistances is observed. This situation suggests that the initial reduction of blood pressure levels observed from week 20 to 32 is followed by a recovery, or a slight increase of prepregnancy pressure levels. During pregnancy, vessel walls are remodeled; a reduction of elastin and collagen is seen, followed by loss of distensibility<sup>5,6</sup>. These adaptations involve a demodulation of vessel selfregulation, and some areas may easily develop vasogenic edema in case of blood pressure levels within normal limits. In some cases, unsuitable endothelial activation follows; this triggers a cascade of events, counting the release of inflammatory cytokines<sup>7</sup>. The latter are supposed to cause the generation and release of strong vasopressor substances. Endothelial activation may cause systemic pressure instability, as well as an abnormal answer to vasopressor stimulation, leading to vasogenic edema. The model that describes the induction process of preeclampsia may be extended

to PRES.

Neuroimaging is necessary for the diagnosis of PRES and the radiological abnormalities encountered in PRES are best showed by magnetic resonance imaging (MRI). MRI shows symmetrical white matter edema in the posterior cerebellar hemispheres that particularly involve the parietooccipital regions bilaterally<sup>8</sup>. T2-weighted MRI shows areas of hyperintense signal and is thought to capture the pictures with the best quality, but fluid attenuated inversion recovery (FLAIR) sequences may improve detection of cortic-subcortical areas of injury and help identify vasogenic edema from cytotoxic edema. More severe radiological findings are more likely to be observed with more severe clinical images<sup>9</sup>.

Therefore, PRES in pregnancy may be the expression of systemic changes in brain circulation detected in preeclampsia. The fact that almost every patient with eclampsia has PRES signs at neuroimaging shows that this syndrome is the first sign of suffering of the central nervous system during eclampsia<sup>10, 11</sup>, rather than its direct consequence<sup>12</sup>. In addition, it was observed that PRES-related MR changes might happen before the development of eclampsia<sup>13</sup>. Therefore, the theory that makes PRES as the appearance of hypertension with eclampsia is not exhaustive, due to the attendance of blood pressure levels within normal limits.

The observation of this consecutive case of PRES in the absence of hypertensive stress should point out that endothelial changes might be significant in the development of vasogenic edema, by reducing the critical interval between the pressure level increase and the blood-brain barrier effects. In line with this interpretation, the explanation of the above reported case might be included within the framework of normotensive eclampsia<sup>14</sup>. Complete remission observed in this case may also suggest that normal pressure levels may be prognostic indexes of positive outcome, combined with a minor incidence of neurological sequelae<sup>14</sup>.

## Conclusion

Posterior reversible encephalopathy syndrome can be occurred in the absent of hypertensive disorders.

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