Postpartum Posterior Leukoencephalopathy Syndrome

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Abstract
In this report we are presenting three patients of posterior leukoencephalopathy syndrome developing in postpartum period. Two of these patients had persistent imaging abnormalities in posterior parietal and occipital regions leading to focal atrophy of brain along with permanent cortical blindness and recurrent seizures. In both the patients the syndrome was either unrecognized, or remained untreated on initial presentation. In third patient also the syndrome was not recognized for 10 days, initial clinical manifestations and computed tomographic (CT) abnormalities remained unchanged even after two months. Failure to early recognition and treatment can produce permanent brain damage and syndrome of posterior leukoencephalopathy may become irreversible.

INTRODUCTION
Posterior leukoencephalopathy syndrome is a newly recognized brain disease that affects, predominantly cerebral white matter. It is often associated with malignant hypertension, eclampsia, renal failure, central nervous system (CNS) infections and drug therapy with cyclosporine, tacrolimus and interferon-alpha. The symptoms include confusional state, visual problems, headache and seizures. The clinical symptoms and neuroimaging abnormalities are often reversible with treatment of underlying condition (e.g. control of blood pressure and removal of offending drugs).\(^1\)\(^2\) In this report we are describing three patients who developed similar syndrome in early postpartum period, but both clinical manifestations and imaging abnormalities were not reversible.

CASE REPORTS

Patient 1
A 26 years woman presented three days after two episodes of generalized tonic-clonic seizures. Both seizures occurred within 24 hours. Patient also gave a past history of single episode of generalized tonic-clonic seizure about 1 year back. The first seizure had occurred two days after she delivered a full-term healthy male child. It was a home delivery, after seizure patient had acutely developed complete vision loss, which did not improve in due course. During this past illness patient was treated by a rural practitioner. Probably, she was treated with phenytoin which she discontinued herself after four weeks. She did not have any recurrence of seizure for one year. She presented to us after second seizure. Patient was normotensive. The optic fundi did not reveal any abnormality. Neurological examination revealed cortical blindness. Cranial nerves, motor system, deep tendon reflexes were normal, and both pupils responded briskly to the light. Her haematological and blood biochemical parameters, and urinalysis were normal. A plain and contrast-enhanced cranial CT scan was performed a week after last seizure. CT scan showed bilateral low-density areas involving white matter and gray matter of both occipital lobes extending up to parietal lobes along with focal atrophy. A 21-channel electroencephalography (EEG) was performed which showed slow-wave abnormality in right parieto-occipital region. Patient was given antiepileptic monotherapy (phenytoin 300 mg/day), she remained seizure-free for next six months.

Patient 2
A 24 years woman had several episodes of generalized tonic-clonic seizures 24 hours after her first delivery, approximately 1\(\frac{1}{2}\) year ago. The delivery was conducted at home. At that time patient also had vision loss. The patient had consulted a doctor and available record suggested that she was hypertensive (190/106 mmHg), and she was given phenytoin (300 mg/day) along with enalapril (5 mg/day) and she was subjected to a cranial CT scan. Patient continued both the drugs only for few days, then discontinued herself. There was no improvement in vision, however she remained seizure-free till the patient was referred to our institution with recurrence of seizure, again in early postpartum period. The second delivery was conducted at a nursing home. Antenatal period was uneventful. The patient had generalized tonic-clonic seizure within 24 hour of second delivery. Following seizure patient had postictal confusion, which persisted for few hours. On examination patient was found to be hypertensive (highest recorded blood pressure
Fig. 1a: Contrast-enhanced cranial computed tomography showing symmetrical hypodensities in both parieto-occipital regions.

Fig. 1b: Computed tomography scan 1\(^\text{1/2}\) year later showing cerebral atrophy in the regions of hypodensity.

was 200/104 mmHg). Patient had cortical blindness. Bedside testing for orientation, memory, attention and language function did not reveal any abnormality. The optic fundi were normal. Patient had generalized hyperreflexia and right plantar was extensor. No abnormality was detected in blood biochemical parameters and urinalysis. Cerebrospinal fluid examination and electrocardiography (EKG) were also normal. EEG done three days after the last seizure showed diffuse intermittent slowing, no epileptiform activity was seen. Patient had cranial CT scan on both the occasions. Initial CT showed an almost symmetrical hypodense lesion in both occipital and posterior parietal regions involving gray matter and white matter (Fig. 1a). The repeat CT scan done three days after the second seizure episode (during second postpartum period) revealed persistence of same hypodensities along with evidence of cerebral atrophy in the same regions (Fig. 1b). Antihypertensive therapy and oral phenytoin (300 mg/day) were started. The blood pressure was reduced to 120/78 mmHg and no further seizure occurred. At the time of discharge no improvement of vision was noted. Approximately, four months later the patient was normotensive and seizure-free, however, still there was no improvement in the vision.

Patient 3

A 22 years woman delivered normally a female child at full term in a local nursing home. Approximately four hours after her first ever delivery she noticed severe bursting headache which was diffuse in nature, and was associated with visual problem. Patient complained that she was not able to see. On 10th postpartum day the patient was shifted to neurology ward of our institution. On examination we found that patient was hypertensive (highest recorded blood pressure was 200/106 mm Hg). Patient was afebrile, there was no pedal oedema and had normal fundus examination. She was alert and attentive but had cortical blindness. Cranial nerves were normal, both pupil showed brisk response to light. All her deep tendon jerks were exaggerated, however, both plantars were flexor. Antihypertensive therapy (amlodipine 5 mg/day) was started. Next day in neurology ward patient had a generalized tonic/clonic seizure. After seizure patient became confused and disoriented, from which she recovered within 24 hours. Now antiepileptic therapy (oral phenytoin 300 mg/day) was also started. Haematological and blood biochemical parameters and urinalysis were normal on two occasions. EEG was performed which showed intermittent generalized slow-wave abnormality. EKG and X-ray chest were normal. CSF examination did not reveal any abnormality. Contrast-enhanced cranial CT scan was done 24 hour after seizure. It showed hypodensities in the white matter of both occipital lobes. The hypodensity was also extending to gray matter on right side. Patient was discharged from neurology ward with normal blood pressure (130/78 mm Hg). A follow-up CT scan was obtained two months later, and similar findings were noted. No seizure recurrence was reported during this period, and there was no improvement in the vision.
**DISCUSSION**

Imaging abnormalities and clinical manifestations of posterior leukoencephalopathy syndrome are frequently reversible with prompt antihypertensive treatment or withdrawal of immnosuppressive drugs. In this series we are reporting three patients who in early postpartum period developed similar clinical syndrome and imaging abnormalities. Our first patient had developed this syndrome one year ago, and sought medical advice only when she had recurrent seizures. CT scan showed bilateral low-density areas along with focal cerebral atrophy in parieto-occipital region. Imaging studies were not performed at the onset of symptoms. The second patient also presented with similar clinical picture, seizure recurrence occurred in second postpartum period. The first CT scan showed extensive white and gray matter oedema in parieto-occipital region. A repeat CT scan showed marked atrophy of corresponding regions. Our third patient, who was under our prospective follow-up despite adequate control of blood pressure, patient did not show resolution of clinical and imaging abnormalities. In all the three patients hypertension was not immediately recognized and was not promptly treated as deliveries were conducted either in home or in an ill-equipped medical centre and persistence of pathophysiological state possibly, has led to irreversible changes in the brain.

The exact etiopathogenesis of this syndrome is not precisely known. Posterior leukoencephalopathy, possibly, results from a rapid and sustained raise in blood pressure that overcomes the brain’s normal ability to auto-regulate cerebral blood flow. This results in segmental cerebral artery spasm, and dilation and opening-up of endothelial tight junctions and increased vascular permeability, and extravasation of fluid and protein into the brain parenchyma. The selective vulnerability of the posterior circulation may be related to differences in autonomic innervation as compared with the anterior circulation. In our cases persistence of imaging abnormalities and clinical syndrome is unexplainable only on the basis of “cerebral oedema” hypothesis. Possibly more extensive and prolonged vascular abnormalities were involved leading to permanent and gross ischaemic damage of affected regions.

Most authorities believe that hypertensive encephalopathy and eclampsia share similar pathophysiological mechanisms. In all of our three patients the posterior leukoencephalopathy syndrome occurred during puerperium rather than during pregnancy. Similar observations were made by Hinchey et al, their three out of 15 patients with posterior leukoencephalopathy were in puerperium. Hinchey et al suggested that, the fluid accumulation often observed during this period might have increased the tendency for brain oedema.

In conclusion, our three patients highlight the need for wider recognition of this syndrome among physicians and obstetricians, as prompt diagnosis and management of hypertension can help in preventing devastating sequelae, like permanent blindness and seizures, in these patients.

**REFERENCES**